THE METAL INDUSTRY
WITH WHICH ARE INCORPORATED
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ETCHED METAL AND COLORED GLASS NOVELTIES.

By S. Louis.

The Tiffany Studios, of Corona, Long Island, and the Riviere Brass & Bronze Works, of New York, have been for some years past engaged in the manufacture of a very good line of glass and metal novelties. One of their chief lines has been in desk fittings, such as pen-holder racks, letter racks, ink wells, stamp boxes, and so forth. Beside this they make jewel cases, lamp shades and even entire lamps of glass and metal artistically combined. Their various lines are kept up to date and find a good market. Since these companies showed what could be done, many others have endeavored to duplicate their success and imitate their goods without actually copying designs. The chief difficulty they have found lies in the etching of the sheet brass. I will describe in detail the entire process.

SPECIMEN OF ETCHED METAL AND GLASS MADE BY REVIERE WORKS.

After etching and shaping, the brass is colored by plating, oxidizing, etc., to correspond with the glass with which it is to be made up. For glass which transmits a yellow light, the metal should be gilded; for grayish or milky glass, silvered; for brown and red glass, coppered and finished in the red oxide. For green glass, the metal should be coppered and finished in a green patina (Pompeiian green). This last finish, in articles of antique design, is the most popular. Since the manufacture of these useful and beautiful objects has proven exceedingly profitable, I believe that this branch of industry ought to be thrown open, and its secrets given out for the future good of the trade in general.

The process is very simple, and can be carried on in any brass foundry or metal workers' shop without special appliances. It is divided into five steps.

(1) Etching of the metal on which the design has been traced.

(2) Cutting the glass.

(3) Fastening the glass to the etched metal.

(4) Grinding and polishing.

(5). Plating and oxidizing.

Sheet brass, usually of 22 gauge, is coated on one side with asphalt varnish with a broad, soft brush, and allowed to dry thoroughly. This varnish can be easily made by dissolving powdered Egyptian asphalt in turpentine and finally adding to the solution a little benzol. The varnish must not be too thick, and a single coat of a thin solution will be sufficient. The designs that are to be etched out are cleaned by laying a stencil pattern on the brass and applying turpentine with a brush.

On the careful manipulation of this step depends the success of the entire process. The stencil is made of tinfoil from which the design has been cut. The pattern is first drawn on a piece of paper or on the foil itself, and the cutting is done on a sheet of glass with a sharp knife. When the stencil is ready it is pasted to the varnished face of the brass with soft soap, which is applied over the varnish with a brush. The soap fills a double function, first, it prevents the pattern from slipping, and second, it prevents turpentine working under the edges of the stencil. The foil is carefully smoothed down by means of a folding-bone or burnisher. The soap is now carefully washed from the parts of the plate exposed by the pattern, and the varnish under it is dissolved by brushing lightly with turpentine on a soft brush. The turpentine and dissolved varnish should be removed by a sponge or soft cloth. When the metal exposed by the pattern is perfectly clean, remove the stencil by carefully lifting one corner and peeling it off. The soap may now all be washed from the plate with a sponge and water. This process, which takes only a few minutes, is repeated, and as many impressions of the stencil are made as the size of the sheet of brass will permit. In order to economize metal, it is well to use a size sheet that will give a minimum of waste in cutting to a given pattern.

Before immersion in the acid, the back of the sheet is coated with a melted mixture of one part yellow beeswax and one part rosin. This cools quickly and hardens immediately. The plates are then laid, with the design up, in a mixture of one part nitric acid to twenty parts water. This bath is contained in a wooden tank or tray, painted on the inside with one or two coats of black asphalt varnish. The plates are left in this thin bath for 14 to 16 hours, generally over night. Next day they are carefully examined to see that the exposed metal is completely eaten away to the wax backing. If this removal is everywhere complete, the plates are removed from the bath. The acid is rinsed off in water, and the protective coatings are removed in a hot solution of caustic potash. The dissolved wax can be recovered later.

Efforts to etch brass plates by means of concentrated acid or with the aid of the electric current have so far not proved successful. The cost of etching is small, as the bath does not have to be renewed often. It is only necessary to add a small amount of nitric acid to it from time to time. Some sorts of brass, especially those high in zinc, etch slowly and give more trouble. Most of this difficulty can be obviated. however, by adding a few drops of hydrochloric acid to the bath.

After a time the dissolved metal begins to crystallize out and is deposited on the bottom of the tank in the form of light blue crystals. These do not interfere in any way with the working of the bath, as the plates are always laid face up. Care must be taken, however, to see that the plates are covered with acid and that the bath is kept up to a strength of one in twenty. After some quantity has accumulated, the deposited crystals may be reduced in the brass crucible.

Concerning the glass cutting it is not necessary to waste many words. Any unskilled hand can cut glass with a diamond. For pieces of special shape it is necessary to employ skilled labor. When the glass has been cut into pieces corresponding in size and shape with the pieces of etched brass, the brass finisher's work begins. The pieces are assembled with the aid of brass V or angle strips, block tin being used as the solder. Feet are soldered to those articles that require them, and hinges to such pieces as have covers. Here there is a broad field for working out constantly new and tasty variations. The flat surface of the etched brass may be relieved by soldering to it any sort of beading, corner pieces, lock entablatures, etc., and the glass may be replaced by other materials, such as plush, leather or wood. In using these, the metal must be plated or oxidized and finished before assembling.

Little candle shades made in this style are very tasteful and popular. These are first stamped in conical or pear-shaped form, etched, silvered or finished with patina and backed up with green or red silk.

Large hemispherical lamp shades with bent glass inserted are coming more and more on the market. The etching process can be conducted just as easily on stamped or spun metal as on flat sheets, as the tin foil stencil follows every detail of conformation. Obviously it is necessary to provide for such articles a deeper acid bath.

When the workman has finished the assembling and the soldered places are filed smooth, the articles are taken to the polishing room, where they are gone over with a brush and polishing powder and oil. Next comes the plating process. The pieces are first cleaned with benzine and then all grease is removed in a moderately hot bath of caustic potash. They are then dried in an oven, and if care is taken may be subjected to considerable heat without danger of cracking the glass. After slow and complete cooling, they are put into the silvering or coppering bath. If the goods are to have a matte finish, they are plated rapidly, or the surface may be roughed with grinding powder and water on a rotary brush.

As has already been said, the goods are finally gilded, silvered, coppered and oxidized or finished in green patina according to the color of the glass. Last of all the plated and dried articles are protected by a thin coat of transparent varnish.

METHOD OF DETINNING.

But few patents deal with the question of preparing old tinplate articles for the purpose of rendering them suitable for industrial purposes. Of late patents have been applied for for machinery for cutting up or perforating tinplate boxes. But the most important question, that of perfectly cleaning the tin, has only in exceptional cases formed the subject of a patent. A patent granted to Karl Goldschmidt and Josef Weber, of Essen-on-the-Ruhr, Germany, on November 13, 1906, considers that in the freeing of metals from tin or detinning everything that is not tin or iron must be looked upon as impurity. It is not sufficient to remove only the lacquer, labels, remains of food, and the like, but also the solder, as it contains considerable amounts of lead as well as tin. This lead is an impurity, since in the various detinning methods in use it combines either with the tin or the tin salts, or else it remains behind with the iron.

A hindrance to detinning, especially of old tin boxes, is the thin ring of caoutchouc which is placed in the fold to make it tight. The fold which holds this ring in place is not attacked by the dissolving agent and a part of the tin is therefore not recovered. The invention mentioned divides the operation into two parts or stages:

First the removal of the organic matter, not including the caoutchouc ring. This is affected with a caustic alkali solution, a 3 per cent solution of sodium hydroxid serving if heated and a 10 per cent solution if used cold. The next step is the removal of the solder and caoutchouc, which can be best done by heating the articles to between 600 and 800 degrees Celsius. In this way the solder is melted off and the caoutchouc is destroyed. Excessive heating is to be avoided since the tin would alloy with the iron. The material cleaned in this manner shows clean and smooth surfaces, and is ready for the usual detinning operation.

Silver can be annealed with the cyanide bath by the following procedure:

Prepare a solution consisting of ¼ pound cyanide of potassium in each gallon of water. Enough solution should be prepared that the annealed metal will be completely covered. When the silver is annealed in the usual manner it is plunged directly into the cyanide bath and the metal will be found to be soft and clean. It is then washed in cold water and dried out by any of the usual methods. As by constant use the solution will gradually contain more or less silver it should not be thrown away. It can be used as silver cyanide.

COKE: ITS MANUFACTURE AND APPLICATION TO FOUNDRY PURPOSES.

By G. B. Waterhouse.

It is rather hard to frame a good definition of coke. It occupies the same relation to coal that charcoal does to wood; and, originally, was produced in a similar way. It is equally hard to give a satisfactory definition of coal. Perhaps the best is that of Dr. Percy: "Coal is a solid stratified mineral substance, black or brown in color, and of such a nature that it can be economically burned in furnaces or grates." Coke is the product that is left when coal is heated without access of air, the volatile liquid and gaseous materials being drawn off.

In the early days coke was made by coal being built up in heaps, covered with sods, and fires being lit at the bottom. The whole was then allowed to burn slowly in a similar manner to charcoal burning. This was the method employed by Dud Dudley, Abraham Darby and the other pioneers of the use of coke. Gradually better ways were introduced, and at the present day coke is made either in bee-hive or by-product ovens. These processes will be briefly described.

The Bee-Hive process is only fitted for coals known as "coking coals." These coals when heated soften, appear to fuse, and give a hard, compact coke showing no trace of the shape of the original coal. On the other hand, non-coking coals do not fuse together, and though some of them give a hard, sound coke, the shape of the original piece is retained. As its name implies, the bee-hive oven is of the shape of an old-fashioned bee-hive. It is in these ovens that the famous Connellsville coke is made, and other celebrated brands, such as the Pocahontas of the South and the Durham of England.

In the Pittsburg district the diameter is about 12 feet and the height 7 feet. They are built in batteries of 100 or more, placed back to back, but not opposite each other, an oven on one side being opposite to the line between two ovens on the other. The interior is faced with silica brick, the outside built of sandstone, and the space between the ovens is filled with earth to keep in as much heat as possible.

The charge is put in the ovens from cars running on the top of the battery and is introduced through the "eye" of the furnace. This is the opening in the dome, about 20 inches in diameter. The charge is leveled by means of tools introduced through the door, after which the latter is loosely bricked up. The heat of the oven ignites the coal, and the volatile matter burns partly inside in the oven, but for the most part outside. It covers the country with smoke in the daytime and illuminates it by flame at night.

The time taken to coke a charge varies with the weight; one of 5 tons takes 48 hours; one of 6½ tons, 72 hours; and these constitute the 48- and 72-hour cokes of commerce. When coked, the charge is quenched by a stream of water through the eye of the furnace. It is pulled out through the doors and loaded on to cars.

The by-product oven received its name in the following way: In the bee-hive process the only product is coke. The volatile liquid and gaseous materials are driven off. In addition to gas and water, these contain the valuable substances, tar and ammonia. The by-product process makes coke, but instead of wastefully burning the gas, collects it, purifies it from water, tar and ammonia; and then uses it, in whole or in part, to coke the charge of coal.

A by-product oven is, as a rule, 33 feet long, 16 to 18 inches wide and 6 to 7 feet high. It is built of fire brick, lined with silica brick and has four openings in the roof for the introduction of the charge of crushed coal. These are closed by cast iron plates, and the oven by cast iron doors lined with fire brick. The ovens are built in batteries, and between each oven are flues, in which the purified gas and air burn, giving heat to drive off the volatile matter from the coal and change it into coke. The different types of oven depend, in large part, on the number, size and method of arrangement of these flues. The gases from the coal are collected in a main from an opening in the middle of the top of each oven, and are led to the condenser house to be purified. Afterwards they are returned and burnt in the flues. When coked, the charge is pushed out by an electric ram, either into cars or pans, quenched and loaded for shipment.

Coke produced by either of these methods is hard, dense and strong. A cubic inch should stand a pressure of from 800 to 1,000 pounds before giving way. The bee-hive coke has a steel gray or silvery luster, which is lacking in the by-product coke. The latter is usually black and dull without luster. A good furnace coke has almost a metallic ring when struck.

An important property is the amount of porosity in the coke. Coke varies in specific gravity, but it is usually about .9. Carbon is about 2.0, so that about 50% of the coke must be spaces. This is important, as a porous coke readily allows the air to permeate it and burns quickly, while a dense coke is almost as hard to ignite as anthracite. Another important property is the heating capacity of the coke, which largely depends on the percentage of carbon. This, in turn, depends on the coal employed, for if the coal was high in ash, the coke will be at least equally high. For a similar reason the coal employed should be low in sulphur. When the coke is burned, this sulphur ignites and is readily absorbed by metals in contact with it, very often doing them harm.

The abrasive qualities of the coke require attention. It has to be handled many times before use, and unless it is strong each dumping increases the percentage of breeze. The bee-hive coke is columnar in structure, pieces often showing the depth of the charge—that is, approximately 28 inches. By-product coke is more rectangular in shape. During the coking the volatile matter is driven by the heat of the walls to the center of the charge, and when the coke is discharged it breaks along this median line. As the width of the oven is 18 inches, the length of the coke is about 9 inches.

For brass foundry purposes the chief use is in the crucible furnace. For this the coke must be fairly strong, but the dense variety employed in blast furnace work is not necessary, as there is no heavy burden to support. Accordingly, a coke may be used with a maximum of cell space. This, however, must not be too high, or else the fuel would burn so quickly that the furnace man would be continually over his fire adding fresh coke.

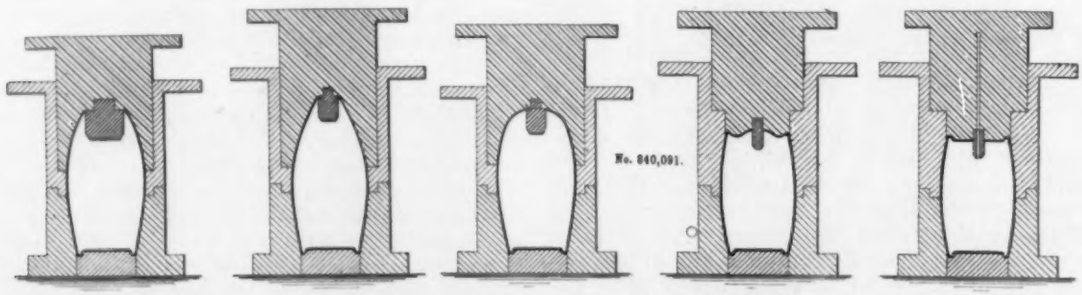
Particular attention should be paid to the sulphur, for crucibles are readily penetrated by furnace gases.

Sulphur is quickly absorbed by the metals, and as mentioned before, often with harmful effect. The ash of the coke is also important. The amount in the first place, and also the kind. More of a white ash can be handled, as this does not so readily clinker and clog the furnace as a red ash.

By-product ovens are now in operation in many parts of the country, and their use is increasing. The coke is equal in every practical respect to bee-hive for foundry use. It is urged that foundry managers bear this in mind, and give the comparatively new material a trial.

MEANS FOR MAKING HOLLOW METAL ARTICLES.

A patent issued to Eberhard Schumacher and John H. Tyson, of Darlington, England, January 1, 1907, describes a method of making hollow metal articles by external and internal pressure. The device comprises a die for the body of the article, a punch fitted to and centered within the die for forming the head or end of the article and a central nipple inserted in the punch and having in it an opening for the introduction of hydraulic



METHOD OF MAKING HOLLOW METAL ARTICLES.

pressure. The metal blank is first brought to a cup shape, at which point the present invention commences, the special object of which is to close the open mouth of the cup so as to form the head. When operating on a cylinder the same kind of closing in apparatus is used for both ends. The accompanying drawings, read from left to right, show the several steps in the operation. In the first is shown the die to receive the power part of the cup and similar parts are employed in the next two operations. The last two drawings show dies of different shape as demanded to bring the blank to the proper form.

DENATURED ALCOHOL AND LACQUERS.

By Chas. H. Proctor.

In the manufacture of brass goods the cost of metal has been so rapid in its advance that it is almost impossible to figure to a certainty unless the constant advance is taken into consideration. This brings to mind that even lacquers and thinners have also increased in price with other goods, this being, of course, due to the rise in price in raw materials. Amyl acetate, fusel oil, soluble cotton and the various gums incidental to the manufacture of lacquers have also risen in price. So it is natural that the manufacturer or purchasing agent should spend much time in getting the lowest quotations.

The advent of denatured alcohol into the ranks of commercial products will no doubt prove interesting and its use will probably prove profitable in lines where grain and wood alcohol have heretofore been used. Grain alcohol is now quoted at $2.70 per gallon, wood alcohol at 80 cents and denatured alcohol at 37 cents in barrel lots.

Since the advent of denatured alcohol the writer has made many experiments, more especially in the line of thinners or reducers for the various lacquers. The conclusion was reached that denatured alcohol in the proportion of 2 parts by measure and 1 part fusel oil can be used effectively as a thinner for all lacquers. The result is a saving of one-half the cost of the usual thinner whether it consists of amyl acetate or a mixture of equal parts of amyl acetate and fusel oil, which is commonly used for brush lacquers. When stock lacquers are used composed of amyl acetate and soluble cotton in the proportion of 6 ounces of the latter to 1 gallon of the former, more adhesive coatings are procured by using this thinner. This is especially noticeable upon polished silver goods, from which collodion lacquers have a tendency to peel and crack unless unusual care is taken in the work of cleaning. I have found that 2 parts of the thinner prescribed and 1½ parts of the amyl acetate collodion, as mentioned, will produce excellent results upon all classes of brass, copper, bronze, silver and gold plated goods when used as a dip lacquer. In the production of brush lacquers it is customary to use 1 part of collodion, as mentioned, and 1 part white French varnish cut in wood alcohol. (Denatured alcohol can now be given the preference.) By adding an equal volume of the thinner to the mixture of varnish and collodion a brush lacquer will be produced that will give unusually fine results. I mention these combinations to show how I have used the thinner prescribed.

In experimenting with standard commercial lacquers I have found that this combination can be successfully used as a thinner in all grades, thus enabling the consumer to obtain a thinner at a saving of one-half over the regular cost.

Denatured alcohol consists of the regular grain alcohol denatured by the use of a certain specified amount of wood alcohol and benzine according to the Act of Congress of June 17, 1906. In the language of the bill it is held that denatured alcohol cannot be used in the preparation of beverages, but can be used in the industrial arts. Manufacturers may use any amount less than 50 gallons per month without any permit and without keeping a record. Users of a larger amount must have a special permit from the Internal Collector of the district.

Denatured alcohol, when it becomes universally known, will be the means of saving an untold amount of money in various ways. The writer is of the opinion that this product can be used in all lines of manufacture where ethyl and methyl alcohol is now used.

LAKE COPPER VERSUS ELECTROLYTIC.

By Andrew M. Fairlie.*

(*Continued from February issue.*)

III.—Production of Lake Copper.

Contrasted with the complexity of winning metallic copper from sulphide ores, the process of smelting the "mineral" and mass copper of the Lake Superior district is so simple that it might be termed "melting." The melting is necessarily preceded, however, by a more or less elaborate system of cleaning and concentration of the copper-bearing rock. The large masses are cut under ground with long-handled chisels, the pieces are hoisted to the surface and are then dressed with hand hammers to remove as thoroughly as possible the adhering gangue, or worthless rock. The smaller pieces are cobbed by means of steam hammers. The cleaned metal is then charged into the furnaces for final treatment.

By far the greater part of the Lake Superior copper occurs in the mines as small particles, disseminated through the amygdaloid and conglomerate rock. Preliminary to concentrating, the rock must be crushed, and this is done mainly by means of steam stamps—hence the rock to be crushed has acquired the name "stamp-rock." From the mine it is hoisted in a skip—a rectangular iron box, on wheels, and open at the top—into the shaft-house, and the load is thrown on an inclined grating of iron or steel bars called a "grizzly." The finer material falls through into the bins beneath, while the larger lumps remain on the bars, to be crushed in the rock house to the size desired. After sorting and crushing, the stamp rock is loaded into hopper cars and sent to the mill. The cars enter the mill on a high trestle, and dump into the mill bins, from which the rock is fed by gravity into the mortar boxes of the stamps as needed. The crushed rock then goes to the jigs, together with running water, and, owing to the difference in specific gravity between the metal and the waste, the vibratory movement of the jigs serves to concentrate the values.

In the recovery of the minute particles of copper, the fine sands mixed with water are passed over concentrating tables of various types, those most used being the Evans slime table—sometimes built with two, three, or even four decks—and the Overstrom and Wilfley concentrating tables. By means of an oscillatory motion, these tables, provided with low parallel ridges, effect an approximate separation of the fine copper from the sands, and the two products are washed into different receptacles. The sands, or tailings, still contain some copper, but at present the amount is considered too small to warrant further treatment, and the tailings are conveyed away in launders (sluices) to a convenient dumping place. Experiments looking to the recovery of copper from the dumps are now under way.

The method of discharging the tailings at the mills of the Calumet and Hecla Mining Company is worthy of note. The tailings leave the mills in the form of sludge, to the extent of 6,000 tons daily. To get rid of this enormous bulk, it became necessary, on account of the flat topography in the vicinity of the mills, to elevate the sludge to a considerable height, that it might flow away by gravity. For this purpose sand wheels, immense structures having buckets on their inner perimeters, were installed. The buckets, when down, dip into the pool of sludge and fill, and when up are inverted and discharge their contents into launders leading far away from the mills. The company has no less than five of these enormous wheels, the smallest of which is 40 feet in diameter, and the largest, 64 feet. The latter, complete, weighs more than a million pounds; its rim, ten feet wide, is provided on the inside with 550 buckets, in pairs, each three feet wide by four and a half feet long; and its total capacity is 55,000 gallons per revolution.

As the tailings invariably contain some copper, so the concentrates are always contaminated with sand; they may carry from 12 to 50 per cent or more of the crushed gangue-rock. This mixture of sand and copper, known as "mineral," and carrying an average of about 60 per cent copper, is loaded at the mill into tram-cars having a capacity of one to two tons. These cars in turn are loaded upon railroad flat cars and hauled to the smelting works, arriving on an overhead trestle. The mineral is then dumped from the tram cars into the bins which feed the reverberatory furnaces.

The regulation reverbatory has a hearth area of 13 by 17 feet, although larger furnaces have been used, notably two at the Michigan smelter—one 20 by 50 feet, abandoned as unsatisfactory; and one 16 by 35 feet, which gives good results. At the Calumet and Hecla smelting works the reverbatories are charged from the top, and have elevated platforms, on which the mineral is dried before charging into the furnace.

Two methods of smelting are followed in the Lake district. The first employs two furnaces, one for melting and one for refining. In the fusion furnace the charge is melted, and the molten mass resolves itself into two layers—the copper, of high specific gravity, on the bottom; and over it the slag, which is simply the fused iron sand contained in the mineral, combined with any flux which may have been used to facilitate the separation of the two layers. The slag is skimmed off, and the crude metal is then tapped into the refining furnace, where the impurities (and the copper as well) are thoroughly oxidized by blowing compressed air into the molten bath—an operation called "rabbling." When the rabbling has proceeded far enough to remove the impurities, the oxidized copper is reduced to the proper "pitch" by poling—i. e., by plunging poles of green wood into the metal. The second method is similar to the first except that the operations of melting and refining are performed in one and the same furnace.

At the end of the poling the copper is dipped and poured into moulds to form wire bars, cakes or ingots. Formerly hand ladles were universally used for dipping, but the practice now generally adopted is to use a large ladle suspended from a trolley which travels along an overhead track. At the Michigan smelter the copper is cast to a Walker casting machine through a tipping ladle. The Calumet and Hecla Company still clings to hand ladles, claiming that by the old method a better looking casting is made. The "set" of cakes intended for rolling is an important matter, as any ridges or depressions in the cake may result in imperfections in the copper sheet. In ingots in-

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tended for brass making defective shapes may be tolerated; but a good looking article is always more salable than a poor looking one.

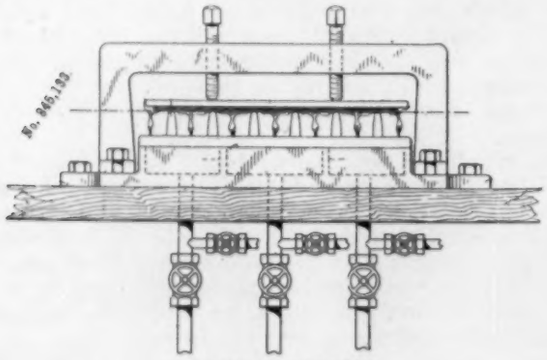
The slag skimmed from the reverberatories, carrying 30 to 40 per cent copper, is smelted in small blast furnaces, or cupolas, with limestone as flux and anthracite coal as fuel. The products of the cupola are impure pig copper and cupola slag. The former finds its way to the refining furnace, and there undergoes the usual treatment—melting, rabbling, poling, skimming and dipping. The cupola slag usually assays low in copper and is granulated and washed away, or dumped.

Two of the Lake Superior plants have adopted furnaces of the matting reverberatory type for smelting their refinery slag. From these the slag flows continuously through a trapped spout into a forehearth, where any excess of escaping copper settles out. The impure copper is tapped intermittently from the bottom of the furnace, and, like the copper from the cupola, is sent to the refinery for the production of a pure metal, ready for the market.

(To be continued.)

PLATING APPARATUS.

A patent granted February 26, 1907, to Thomas J. Slade, of Pawtucket, R. I., and by him assigned to Smith Brothers, of Providence, R. I., relates to appliances used in preparing composite plates used in the manufacture of plated jewelry. A plate of this kind comprises a relatively thick layer of base metal, a thin outer layer of precious metal, as gold, and an intermediate layer of solder. These layers, being assembled, are subjected to



PLATING APPARATUS.

heat while firmly clamped together, the heat melting the solder and resulting in the union of the layers.

It has been customary to secure the assembled layers by means of independent clamps, which are movable with the layers, the whole, clamps and layers, being then placed in a plating furnace which is internally heated by gas burners. It is very evident that with this method the inspection of the work is only done with the expenditure of considerable time and labor.

In the new method here considered the layers are supported upon studs, which they are clamped against. These studs cover very small areas of the base plate, so that the gas jets play against the greater part of the base plate. Each stud is independent of the others so far as its contact with the work is concerned, and therefore the jets are free to play in all directions between and around the studs.

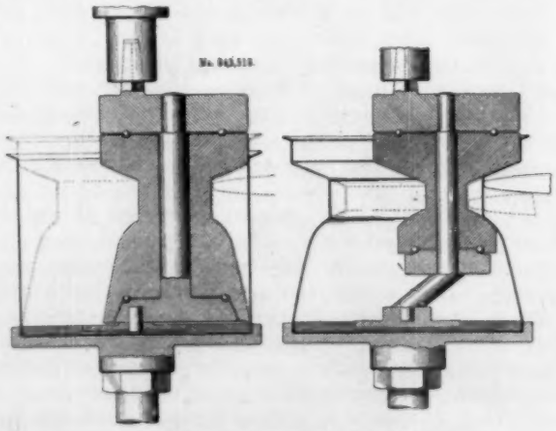
MARKING WATCH CASES IN ENGLAND.

Consul Albert Halstead reports from Birmingham that a decision of the court of appeal of the British Supreme court of judicature construing the merchandise marks act of 1887, makes it necessary that "hereafter watches of foreign manufacture whose cases are gold or silver must be assayed, stamped and marked before being offered for sale in the United Kingdom." The consul then states: "The attention of the British Board of Trade has been called 'to the difficulty of placing on watch cases of small size the marks prescribed by order in council under the merchandise marks act of 1887, without injury to the watch case, and it is suggested that a new order should be made prescribing the more simple marks placed on foreign plate which could be used without much difficulty.'

"It is further stated that the Board of Trade before making a decision on this point is ascertaining the opinion of the British trade and that 'so far as can be gathered there is little objection to the proposed change, if care is taken that the foreign mark is not of less size than that placed on home-made articles.'"

APPARATUS FOR SPINNING SHEET METAL.

Letters patent granted to Ralph Clarke, of New Castle, Pa., February 5, 1907, and one-half assigned by him to the New Castle Stamping Company, provides a new method for spinning distended articles. Heretofore such articles have been made with the aid of expanding mandrels, the article being spun to final form over the sectional mandrel, which is then collapsed and taken out section by section through the mouth. This method has always been objectionable on account of the time required to make the change and the danger of making



SPINNING SHEET METAL.

marks or creases along the meeting edges of the sections of the mandrel. The way now under consideration provides a sectional bottom in combination with an eccentric former, which is preferably in the form of a roller. By using two or more formers of different shape it is possible to narrow the mouth and at the same time withdraw the former. The blank may be removed for annealing without any trouble and with no delay. By using the sectional bottom with the eccentric mandrel the creases just mentioned cannot be produced.

Last year Great Britain imported gold to the value of $224,066,300, and silver to the amount of $84,132,500. Most of the gold came from South Africa, with Australasia second, and most of the silver came from France.

THE CARE OF CORE MACHINES.*

By George H. Wadsworth.†

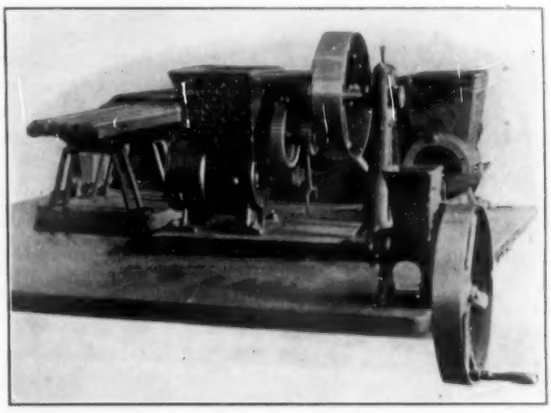
There are, no doubt, with us this afternoon a great many older men who have had a great deal more practical experience in regard to running and looking after core rooms than the writer of this article. But from personal observations of the writer, the majority of core rooms have but very little attention whatever given them from the principal heads of the foundry departments. A great many core rooms in times gone by were located in some out-of-the-way place, or in some dark corner, where it was a hard job to find them at all. This applies principally to small jobbing foundries, and we must give credit to modern foundries which have been built within recent years, and in which we can say that the core rooms are as well taken care of, as regards room, light and equipment, as any other part of the foundry. But there is still room for improvement in a great many modern core rooms by the installation of core room equipment and appliances, and the giving of the necessary care and instructions, as well as in any other part of the foundry.

In times gone by there was nothing to take care of by the party in charge of the core room but the mixing of the sand, the care of the core boxes (made from either iron or wood) and the making of the cores according to the orders received by him from the foundry foreman every day. It was "Get these ready for to-day's heat." How, why or wherefore, as long as he got them, was never taken into consideration. And how many of you gentlemen who have charge of foundries have had your core-maker foreman report to you a loss of half a core box, or sometimes a whole core box, making it necessary to go to the pattern shop to have new core boxes made before the casting could be poured.

Then, again, core boxes become worn, and how many core-makers know enough to report to their foreman the wearing out of shape of a core box? Very few, and until some castings are lost by having them rejected by the machine shop, very little attention whatever is ever paid to the matter.

Customs are now changing. Since the installation of core room machinery, our core-makers are getting more familiar with it, and how to take care of it. How did this come about? We all know that in a machine shop custom educates boys to use the oil can and take care of the machine that he is operating, and this is just as necessary in a core room. Was it done when core machines were first being introduced in the core room? I say no. I have personally gone into core rooms after a machine had been installed and found it had never been oiled since it was received, and when an oil can was asked for it would take from fifteen to twenty minutes to find one, and when found the probabilities were that the oil would not be fit for use. But times are changing. When the men and boys take as much care of their tools and equipment in the core room as is the case in the machine shop, core machines and equipment will last considerably longer, and will give a great deal more satisfaction, and it will certainly educate the core-makers to have a more observing mind.

The oil can has been merely used as an example to show that small things have not been taken into consideration in the core room. Now, if so little attention is given to small matters, how much is given to the larger ones which are much more costly? Core-making machinery and equipment is becoming more generally used every day, and from the building of one type and operating of same, which machine made cores from ⅜ to 1½ inches, we have to-day five different sizes and types of machines, which all originated from the ⅜ to 1½-inch, which is generally known as the sausage-stuffing type. This machine was built and put on the market about August, 1901. The same machine was afterward increased in size, and became a standard at 2¼ inches for two or three years, until the writer designed and built a machine to make up to 5 inches, for which he afterward made larger dies and increased it to 7 inches. At that time it was supposed that this would have to be a power machine,



THE WADSWORTH CORE MACHINE.

but we will be pleased to demonstrate to you gentlemen to-day the making by hand of a 7-inch core 24 inches long in from 15 to 20 seconds. Another type is our speed-changing core machine, which has a slip gear and can be changed in speed for small and large cores. We also have a machine for making slab cores from ⅝ by 4 inches, 24 inches long to 1½ x 9 inches, 24 inches long, and still another which we term our Multiple machine, which makes six 1-inch round cores at a time. This machine was designed to make knob cores .298 of an inch square, and we were allowed a variation of two one-thousandths of an inch, one one-thousandth under and one one-thousandth over size.

Concerning the sand requirements and the core binders, we may say that the sand and binder to use depends upon a great many local conditions, and it will be best to take these subjects up in connection with each individual case.

THE HAMMER CORE MACHINE.

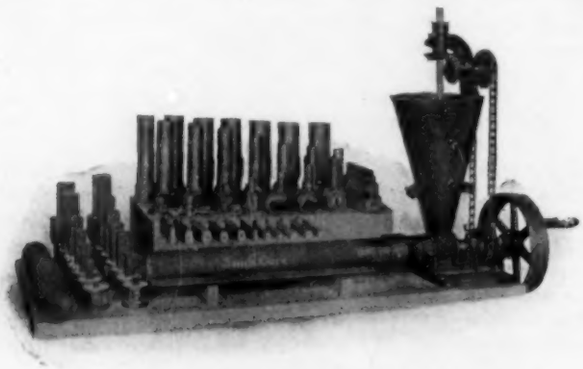
One of the special features of the core machine built by the Brown Specialty Machinery Company, of Chicago, Ill., is the force feed which not only agitates the sand and keeps it loose in the hopper, but actually forces it into the bit, conveying it to the forming tube. Until a year ago this machine was equipped to make only round cores up to 2¼ inches, but now it is adapted to make

*From a paper read before the New England Foundrymen's Association, February, 1907.

†Falls Rivet and Machine Company, Cuyahoga Falls, Ohio.

round and oval cores up to 3 inches, also square, hexagon, and many irregular shaped cores. Another advantage claimed for the machine is that all these cores are made on one machine.

This machine does not require skilled attendance. It is supplied with trays on which the cores are delivered in lengths of 18 to 24 inches, ready for baking. The cores are made of very dry sand and are quickly baked. The



THE HAMMER CORE MACHINE.

machine is arranged to be run either by hand or belt as may be desired. Some 1,500 of these machines have been marketed since 1902 and they are in use in China, Australia, New Zealand, South Africa, South America and all European countries.

AUTOGENEOUS SOLDERING OF NICKEL AND ALUMINUM.

The welding of metals electrically and with the oxy-hydrogen flame is comparatively well known, and more or less extensively employed. Welding with the much greater temperatures obtained with the acetylene-oxygen burner may be said to be now in the transition stage of development, although practised to a considerable extent in Europe.

Trouble has always been experienced in applying any of the above mentioned methods to the welding of nickel or aluminum, except the first. Both these metals when heated in the open flame oxidize and the film thus produced prevents the union of the surfaces. In the case of iron and the acetylene-oxygen flame the case is different as the heat, being above the disassociation point, prevents contamination of the exposed surfaces.

M. U. Schoop claims to have solved the problem in regard to the soldering of nickel and aluminum with an intense flame by the use of a flux or borax-like substance which effectually protects the surfaces during the operation. The union made by this means does not depend upon the intervention of a binding material but is a true welding of the abutting parts of the metal itself.

In order to more fully examine into the matter we addressed an inquiry to the Aluminum Company of America asking their opinion regarding the autogeneous soldering of aluminum. In reply we received the following:

"As you are probably aware, there are a number of patents disclosing methods of doing this, and in addition to this, we have had a number of secret processes submitted to us looking toward the same end. We have investigated the methods by the existing patents, and also the so-called secret processes, in our laboratory, and have found that none of the processes appear to have any particular advantage over any of the others. The autogeneous soldering of aluminum appears not to be difficult to accomplish, providing the proper methods of applying heat and the proper manual dexterity are present. So far as our observation has extended, usually any flux such as alluded to by Mr. Schoop appears to be unnecessary, and all of our tests have shown that the results can be accomplished as readily without a flux as with it. It may be true, however, that Mr. Schoop's flux will facilitate the operation, but we have not had an opportunity of determining whether or not such is the case."

In the above communication the expression "manual dexterity" is to be noted. In our opinion this is perhaps the most important stumbling block in the whole process. In the Thomson electric welding machine, which handles aluminum and nickel without undue trouble, the human factor is entirely dispensed with, since the machine provides a dexterity which cannot be approached by the hands. Nevertheless it appears probable that the end of the search is not yet, and the convenient and easy union of nickel and aluminum is still a future problem.

REDUCING TIN AND LEAD DROSS.

By Lincoln Burrows.

In reducing the lead dross in a crucible furnace to metallic lead the flux most generally used, as it is cheap, is soda ash and charcoal. However, a small addition of carbonate of potash (or pearl ash) helps to make a quicker and more fluid fusion, Heat after an intimate mix in a good bright fire and when the fusion becomes quiet, take out the crucible, tap to collect the metal and pour. The slag leaves the bottom clean but it is always well to break up the slag for small pieces of metal, commonly called "prill."

To one part of dross use 2 parts of the following flux:

Soda ash 25 parts.
Pearl ash 7 parts.
Very fine charcoal 2 parts.

To reduce tin drosses it takes a higher and longer heat and more care in making up the charge. There are two methods, one with cyanide of potash and the other with black flux substitute. To reduce with cyanides the dross must be thoroughly mixed with the pulverized cyanide, the crucible must have a layer of cyanide in the bottom, then the charge and finally a cover of cyanide. The fusion must be at a high heat for half an hour. The melt is poured into an iron receptacle and a stream of water run over it and the cyanide allowed to leak out and run off to the sewer, the fine metal is found in the bottom of the iron receptacle. It is collected, melted, drossed and cast.

To one part dross use 8 parts of cyanide.

Caution! Extreme care must be used in handling cyanide as it is deadly poison. If one has sores or pimples on his hands or face, it will produce a cyanide sore which is very painful and difficult to heal. Protect the hands and face and do not breathe the fumes. The fusion must be carried out either in the open or in a good draught of air.

Tin drosses may also be reduced by mixing 5 parts dross with 1 part fine charcoal, and over this (in crucible) place 15 parts black flux substitute, cover with salt and lay four or five large lumps of charcoal on the salt. Heat one hour in a hot fire.

Black flux substitute:

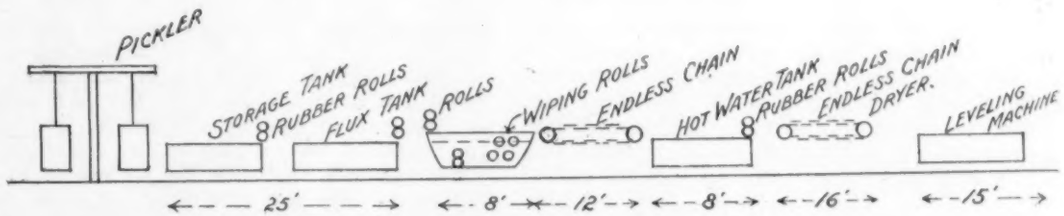
Soda ash 10 parts.
Flour 3 parts.
Borax glass 1 part.

The operations described above are for a crucible furnace and for reducing dross on a small scale. The reduction of tin and lead dross in quantity is usually done in a reverbatory furnace and the flux generally used is soda ash.

THE HOT GALVANIZING PROCESS.

By Geo. J. Galvano.

The hot process of galvanizing is carried out in the following way: Black sheets are brought to the pickler, where they are automatically pickled by a steam machine, which is a vertical cylinder having three arms projecting from the top. These arms have large chains attached to the outer ends and extending down about half way and to which the crates are attached. The pickler has two vats, one containing sulphuric acid and the other water. While two of these arms are working in the water and acid one crate rests upon trestles and is being unloaded and loaded up again during the process of pickling and rinsing the other two crates. The plates are unloaded into a storage tank and then the crate loaded up again with new plates; it is then swung around over the acid tank and the crate that has been working in the water is again set down on the trestles, unloaded and loaded up again, and so on constantly from Monday morning until Saturday night. The plates are then passed through rubber rolls which squeeze the water off them into a shallow tank containing flux; thence they are passed through a set of rolls in the top of the galvanized tank and just above the metal line. These two rolls are boxed in and contain sal ammoniac.



DIAGRAMMATIC SKETCH OF GALVANIZING PLANT.

The most improved machines contain two rolls in the bottom of the tank, and four finishing rolls, two of which are under the metal and the remaining two slightly less than half out of the metal. These two rolls are used exclusively to squeeze off any surplus metal. After passing out of the pot, the plate falls on an endless chain running over sprocket wheels, and is carried to a tank of hot water. It passes down through the hot water, out of the tank at the other end, through rubber rolls again, and thence on an endless chain through a dryer, and thence through a leveling machine on to a truck. They are then taken to the packing scales, where they are bundled for shipment.

This entirely completes the galvanizing process, but some plants are arranged so that sheets are carried to a corrugating machine and thence on a truck to the bundling department. Another arrangement is to corrugate them and then pass them through a tank of red paint, and thence out to the dryers. Any number of these galvanizing plants can be placed side by side, each, however, being complete and in no wise dependent upon the other.

The Board of United States General Appraisers has decided that decorated china vases with bronze mountings must pay 60 per cent duty under the provisions of the tariff law for "decorated china." It was claimed by the importers that the articles should be passed at 45 per cent as manufactures of metal. But as the chief value of the merchandise is china, the authorities decided that the assessments under that classification should hold.

PROCESS OF MIXING ZINC AND IRON.

Letters patent granted to John D. Prince, of New York City, and Howard S. Rodgers, of Covington, Ky., January 15, 1907, provide for the mixing of zinc and iron in any desired proportions, the resulting mass being homogeneous throughout. In carrying out this idea a flux is employed composed of equal parts of sulphate of iron, sulphate of zinc, sal ammoniac and boric acid, which are pulverized and throughly mixed together.

In carrying out the invention any amount of finely divided zinc, depending upon the proportions desired in the mixture, is taken. To this is added an equal amount, by weight, of the flux. The two are then intimately mixed. This mixture is then covered with clear water and is left to stand for at least an hour. The liquid is then drained off and the mass remaining thoroughly dried. After it is dried it is placed in a tube or gutter of sufficient size so that it may be freely poured therefrom.

The iron which has been melted is then poured into a mold which is to receive the mixed metal. As it is being run into the gate of the mold from the ladle the mixture of zinc and flux in its dry, cold form is run into the mold from the tube or gutter at the same gate and at the same time with the molten iron. This causes the two metals to mix thoroughly together into a homogeneous mass. The mixture of the flux and zinc may be poured into the molten metal as above described without being treated with water; but it is preferable to treat it as described to prevent the boiling of the boric acid in the metal.

We take the following from the specifications: "The resulting metal comprising the mixture of iron and zinc is thoroughly homogeneous, in that the zinc and iron are in the same proportions throughout the mass, is fine grained, and susceptible of high finish. It is adaptable for excessive high-speed journals, and its strength is increased. It is also less liable to oxidate. It is easier to machine than the other well known hard and strong metals."

MAY SUBSTITUTE IRON FOR BRASS IN PINS.

United Consul Halsted, in making the statement that pin making is an important industry of Birmingham, England, and that these pins are sold all over the world, adds: "I am informed that if the price of copper continues to advance, pin makers will be forced to make a large proportion of their pins of iron instead of brass. So many kinds of pins are now put up in packages of various styles that have been sold at the same price that they cannot, without serious loss of trade, advance the prices of such so-called proprietary articles."

The Forest City Railroad of Cleveland, O., has introduced aluminum railroad tickets. They are about as big as a three-cent piece, and will be taken by the company in lieu of change.

THE DEPOSITION OF METALS ON NON-CONDUCTING SURFACES.

By Joseph Dimes.

Many beautiful articles are manufactured at present by the deposition of metal on non-conducting materials, such as lace, paper, plaster, wood, wax, glass, and porcelain. The process of deposition on glass and porcelain I have described in a previous issue of The Metal Industry.

Lace and fabric can be handled practically in the following manner: Take a square piece of lace and place it over a form of a lamp shade for illumination. If it is to be stiff and rigid when finished give it a coat of thin shellac (if it is to be flexible do not use shellac), then place it in a solution of nitrate of silver and hang it in a box into which a stream of sulphuretted hydrogen gas is forced which will metalize the silver and make it a conductor of electricity. It can now be rinsed in water and placed in the plating bath. It will be necessary to have a number of connecting wires on the article at first and after it is all struck up remove all but one of the wires and plate the article as heavily as required for your purpose.

Articles from wax molds are prepared by first making a cast of the pattern, which is slightly oiled and put into potters' clay. A wall is built around it about one inch above the highest part, and then a mixture of pure beeswax and tallow is poured over. When this is cold the clay is removed, and the wax will part readily from the article. It is then black-leaded with Dixon's electrotyping black lead, No. 746; when this has been thoroughly done a wire is placed around the mold and the back and all parts outside the wire are stopped off. The mold is now put under a light stream of water to wet the surface and prevent air bubbles in the solution. It is then placed in the solution—either copper or silver—or it is first covered well with silver and backed up with copper.

Plaster and wood are boiled in paraffine and then black-leaded, when deposits can be made without trouble; busts and plaques can be finished in this way. This process produces such perfect results that it is very hard to tell a genuine bronze casting from a plaster cast electrotyped.

Leaves, flowers, insects, leather, and even a person's hand, can be successfully covered with metal by one or the other of the above processes; or the work can be done by flowing over the article a solution of silver nitrate, followed by a solution of phosphorus in bisulphide of carbon, which will metalize the silver and render it conductive.

METHOD OF COATING LACE WITH METAL.

According to a patent issued to John A. Daly, of Washington, D. C., February 12, 1907, provision is made for coating lace, knitted, netted, or woven material with metal, by electrodeposition. In carrying out the invention the lace is stretched on a frame, and is then covered with a thin, even coating of shellac, which is applied with a brush to both faces of the lace. When dry the surface is covered with an aqueous solution of nitrate of silver and allowed to partially dry; but before the silver nitrate has thoroughly hardened the surface is again painted with an aqueous solution of sulphide of potassium. The effect of this is to decompose the nitrate of silver, the products of the decomposition being sulphide of silver and nitrate of potassium. The lace is now washed in water, which removes the soluble nitrate of potassium leaving it covered with a coating of sulphide of silver, which is a conductor of electricity. This coating of sulphide of silver is comparatively inert and will not destroy the fibre of the lace by its caustic properties.

The lace so prepared is then connected with a number of thin copper wires, which lead to a number of points on the surface of the lace. The object of having a number of such connections is to have the electrodeposition begin in a number of places and spread rapidly, so as to save time and also to give a substantially uniform coating of the deposited metal.

The lace so coated and wired is then suspended in a plating bath, when the electrodeposition takes place on the surface of the lace, the silver sulphide serving as a conductor for the deposited metal. After the lace has been in the bath a few minutes it is removed and the wires withdrawn. The lace will now be found to be covered with a thin coating, which is termed a preliminary coating of the metal from the bath. The lace is then immersed in an alkaline bath to neutralize any acid remaining and is then washed. The lace is then stretched out and brushed over on both sides with a scratch brush to bind the crystalline metal of the deposit more firmly together and to the threads of the lace. The brushing down compacts the metal and serves to exclude acids during the subsequent treatment.

After this no further wiring is required than the usual wire connections such as are usual in plating. When so connected and again immersed in the bath the deposition of metal may be continued to the desired thickness. When it is desired to retain the lace in flexible condition, the first step of coating with shellac is dispensed with. The nitrate of silver is then applied directly to the lace.

Heretofore a conductor has sometimes been made by treatment of the lace with nitrate of silver, but that material is so caustic that it is very apt to destroy the fibres of the fine threads and render the coarse threads weak so as to be easily broken. By neutralizing the caustic properties of the nitrate almost immediately this defect is avoided and the strength of the lace is preserved.

ELECTROPLATING NON-METALLIC SUBSTANCES.

An invention by Evan L. Livingston, of Munhall, and William McNulty, of Allegheny, Pa., for which a patent was issued December 11, 1906, describes a method of electroplating non-metallic substances. It is especially applicable to the metallizing of paper or similar coverings for walls, though it is also applicable to wood or other material. The article to be treated is held upon a vacuum board and the exposed surface is covered with an adhesive material, such as show enamel and asphalt varnish. Upon this there is applied the graphite or metal powder, such as copper bronze with a brush. The article is then placed in the bath and electroplated in the usual manner. In this manner the paper is coated only on one of its surfaces, namely, the one which has been prepared with the powder coating. It is claimed that the process is very rapid and that the coating is uniform and adherent throughout.

A brighter lustre may be obtained on articles made of sheet brass if after being dipped in aqua fortis and washed they are immersed in the potash bath. This produces an oxide which the bright dipping bath attacks readily with the production of a much brighter color than by the usual method of dipping directly from one acid into the other.

A statement published in the London *Financial Times* gives the estimated production of copper of the world in 1906 at 730,000 tons as against 708,000 tons in 1905.

HEAT TREATMENT OF COPPER AND DIRECT ROLLING.

By H. J. Martin, Swansea, Wales.

In the usual heat treatment of copper preparatory to, and also subsequent to, its mechanical treatment in the ordinary course of manufacture into plates, sheets or bars, many drawbacks are encountered which might be avoided almost altogether by employing the direct rolling process in connection with copper refineries, from which the usual products, still containing a considerable amount of heat after solidifying from their original molten condition, would then be immediately transferred straight to the "breaking-down" rolls and there rolled with as little delay as possible, the semi-plastic condition of the interior metal of the cakes or bar ingots enabling the metal to be worked with the utmost facility and under the best conditions, and at the same time, by reason of the squeezing and extruding effects produced by the great pressure exerted upon it while between the rolls, would bring about the elimination of many grave defects, such as blowholes, pinholes, etc., now often present in the copper, and as a consequence ensuring the production of sounder metal than if the cakes, etc., had been allowed to cool down after being cast in the ordinary way.

In order to make the metal as homogeneous and compact as possible, among other means fluid compression has been employed to bring about this object, by the application of hydraulic pressure on the metal immediately after it has been run into the mould. But it may be surmised that the metal so rapidly parting with its heat on comign in contact with the mould surfaces and thus becoming chilled, must form an outer crust or shell which enables it to resist the exterior pressure, at any rate, sufficiently to prevent the whole of the occluded gases in the interior from being expelled.

Many important facts in connection with the heat treatment of copper have been described in an interesting and instructive paper by Thomas Johnson, June 2, read on 8th of May last, before the Birmingham Metallurgical Society, in which he enumerates some of the risks and their causes, such as overheating, or "burning" as it is often called, attribuing its occurrence to the pieces being raised to a temperature of within 200 degrees or 300 degrees C. of its melting point, and so causing the copper to become intensely brittle and absolutely unreliable for rolling purposes; and unless due care is exercised, the great liability of this taking place in the preliminary heating for the breaking-down rolling operation. Moreover, another serious danger to which the copper is exposed is subsequent reheatings for the carrying out of the more advanced rolling stages or for annealing, etc. (in which, as a rule, much lower temperatures are employed, a faint red heat mostly sufficing), being mainly due to being acted upon by the reducing gases of the fuel, which tend to deoxidize the copper; this "gassed" condition being brought about through the oxygen, which generally permeates the whole mass as suboxide, being, as it were, sucked out by combination with the fuel gases, leaving the mass of copper in a more or less porous, and consequently brittle state. He illustrated this action by describing the effects of such "gassing," by passing pure dry hydrogen over a piece of electrolytic copper at about 700 degrees C. and which was almost destitute of oxygen and subseouently found to retain all its original virtues, no ill effects whatever being produced; whereas in another piece of wire made from electrolytic copper (afterward refined, cast and manufactured), but in this instance containing the usual amount of oxygen and of necessity of good malleable quality to stand the mechanical treatment it had undergone, he treated similarly with hydrogen and in this instance, subsequently found that it had become excessively brittle and had lost all its good properties as well as a certain proportion of its weight caused by the abstraction of the oxygen.

From the preceding it will be readily seen that, by adopting direct rolling and thus obviating so much of the reheating now necessary, that the risks there indicated must be minimized to a very considerable extent, in fact, eliminated entirely as far as the breaking-down operation is concerned, as well as for the next rolling stage in many cases where certain classes of products permit of a run of work of one size, done by merely passing the plates after being broken down straight to the "drawing-on" rolls and there extending them to the utmost limit that the heat which they still contain admits of; thus it will be seen that up to this point all the rolling would have been accomplished by means of the initial refining heat, entirely without the aid of heating furnices, requiring reheating only for the finishing operation. Many products, indeed, may be entirely finished as far as rolling is concerned, by the original refinery heat and it must be obvious that the gain from the saving of fuel for heating furnaces alone must be considerable. The full advantages that may be derived by direct-rolling, not only for copper, but also for alloys that may be rolled hot, have been already dealt with in former articles.

COST KEEPING IN ROLLING MILL.

By Rolling Mill.

In the neighborhood of Waterbury, Conn., the same general line of cost keeping is followed. The following system is used in the casting shop:

Labor account:	All wages paid to employees of that department.
Material account:	Copper, lead, zinc, tin, etc., used in making metal.
Expense account:	Fuel, crucibles, oil, brushes, pokers, tongs, etc. All incidental charges for furnace repairs and tools belonging to that department.

An account of good metal made, in pounds.
An account of poor metal made, in pounds.

The sum of the labor, material and expense accounts, and credit for scrap returned, against the total amount of metal made will give the cost per pound.

The labor account is a straight account of wages paid as per pay roll or time book.

The material account is the charge from the stock room of the raw material weighed out and delivered to the casters.

The expense account is all supplies furnished from the supply room or department, and also such charges as are made by the renewal and repair department.

ROLLING MILL DEPARTMENT.

Labor account:	All wages for that department.
Material account:	Metal delivered to the mill from the casting shop.
Operating expense account:	Power, supplies such as acid, oil, waste, etc.
Repair and renewal account:	To machinery and buildings—everything connected with the mill.
Per cent. of general overhead charges:	Taxes, insurance, office, selling expenses, etc.

An account of metal shipped and metal returned.

This gives the total cost of metal made and will give the average cost per pound.

As to the depreciation on mill machinery and buildings 5% is allowed at the end of each year.

THE NEW PLANT OF A. MERLE COMPANY, SAN FRANCISCO, CAL.

We picture in this issue the new plant of A. Merle Company, of San Francisco, Cal., manufacturers of brass and iron beds, and ornamental brass and iron work.

Forty years ago, the little shop from which this plant sprung was started on First street, between Mission and Minna streets by A. Rudgear, who is still president of the firm, and was known as the San Francisco Novelty & Plating Works. The principal business was plating in gold, silver and nickel and the manufacture of silver plated copper amalgamated plates for use in stamp mills to save gold. This shop continued in existence until 1885 when the business was moved to the six-story building situated on the corner of First and Mission streets. The new plant was equipped to turn out ornamental iron, brass and bronze work, in which direction the firm scored a great success. In 1890 a new line was added, and a complete factory established to manufacture gas and electric fixtures.

When this department was in perfect operation Mr. Rudgear conceived the idea of establishing a plant in San Francisco for the manufacture of brass and iron beds. After making a trip East and examining the metal bed factories there, the Pacific Metal Bedstead Company was organized, and in 1890 a factory was established on a small scale, and after the usual difficulties was voted a success in 1898. About that time the corporation known as the A. Merle Company was formed; this took over the San Francisco Novelty & Plating Works and the Pacific Metal Bedstead Company, and it was then decided to purchase the real estate on which the present factories stand and build large and extensive works.

VIEW OF PLANT.

The new buildings were completed in 1900 and occupied at once. Business was prosperous—the firm continued to grow and in 1902 the employes numbered 260 In November, 1905, the corporation determined to establish a rolling mill and purchased a block of land adjoining the factory and commenced the erection of the mill. The work was practically completed when the great fire of April destroyed the entire plant. Since that time all the energy and resources of the company have been devoted to rebuilding the plant.

The ornamental iron and bronze department was in operation July 1, 1906. The metal bed plant commenced delivery of beds on October 1, 1906, and the rolling mill commenced work last month. With the plant operating to its full capacity the number of employees will be about 900; at the present time there are the following: brass bed department, 48; iron bed department, 196; metal polishers and platers, 38; iron foundry, 23, and ornamental iron plant, 138. The plant occupies two city blocks adjacent the tracks of the Southern Pacific and Santa Fe railroads, with special spurs to loading platforms at the buildings.

The equipment in the plating department is very complete, the silver tank being 8 feet deep, 18 feet long and 3 feet wide. This permits of plating sheets 18 feet long, the largest sized copper plates such as the company make for the great mines of California, Oregon, Nevada, Mexico, British Columbia, Montana and Idaho. There are also immense copper tanks for plating iron castings for store fronts of modern buildings. Other tanks are for brass, nickel and gold solutions.

The ornamental iron and bronze departments are now complete in every detail. In the past these departments have produced magnificent bronze and iron work, most of which was destroyed in the fire. At present the force is engaged in rebuilding the great buildings which withstood the fire, such as the St. Francis Hotel, Mutual Savings Bank building, Merchants' Exchange, Grant building and Aronson. The metal bed department is producing 700 beds daily; with the factory finished the capacity will be 1,000 beds per day.

PART OF BEDSTEAD ASSEMBLING ROOM.

NICKEL ANODES NOT SHEETS.

An interesting decision has been made by the United States Circuit Court at New York upon the classification of nickel anodes imported by Hermann Boker & Co., of New York City. Paragraph 185 of the tariff law enumerates nickel, nickel oxide and nickel alloy "in pigs, ingots, bars or sheets" and the decision holds that nickel is not included unless in one of the forms enumerated and that anodes in the form of plates are consequently excluded. In defining the word "sheets" as used in the law Judge Hazel says a sheet of metal is comprehended to be broad, thin and expanded, whereas anodes, consisting of nickel plates about 12 inches long, 6½ inches wide and less than half an inch thick, which are cut from nickel sheets, are not sheets within the meaning of paragraph 185 relating to nickel in "sheets, etc."

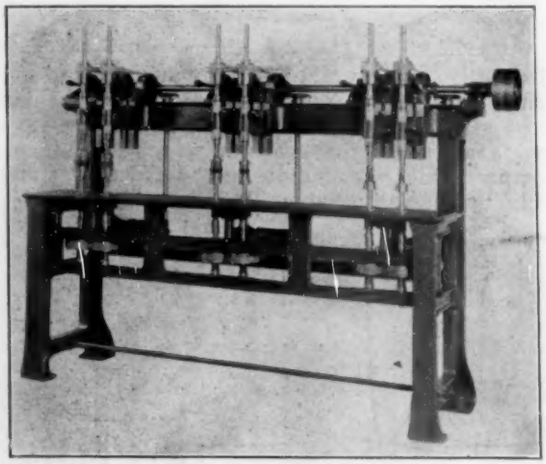
This decision affirms a ruling made by the Board of United States General Appraisers in which it was held that the nickel anodes cut from nickel sheets and used in nickel plating are properly dutiable as manufactures of nickel under paragraph 193 of the tariff at the rate of 45 per cent ad valorem. The anodes, which are the subject of the litigation, are made capable of practical use by the drilling of holes in order that they may be suspended in the bath for the plating operation. Although both the board and the Circuit Court have found against the contention of the company, it is probable that the case will be carried to the Appellate Court.

INDUSTRIAL

NEW AND USEFUL DEVICES, MACHINERY AND SUPPLIES OF INTEREST TO THE NON-FERROUS METAL INDUSTRY.

SPECIAL GRINDER FOR PIPE UNIONS.

Among the special machines recently gotten out by the Turner Machine Company, Philadelphia, Penna., is the six-spindle grinder shown herewith, for grinding the faces of ball or rocking-joint pipe unions. The two parts of the union are chucked between upper and lower spindles as shown, the upper one being driven at a high speed, while the lower part is carried by the slowly revolving lower spindle. This spindle has a yielding support on the



SPECIAL GRINDER FOR PIPE UNIONS.

spring shown; it also has a rocking motion, cam actuated, closely imitating that of the human hand in grinding. The resulting product is pronounced by the users very satisfactory work. Each pair of spindles—two upper and the corresponding lower spindles constitute a pair—is belt and gear driven through a clutched sleeve on the main shaft, independently of the others. Three men on this machine turn out daily a product in excess of that of double their number on the old hand machines, as the simple quick chucking device furnished together with the means provided for locking the upper spindle at any point, permits of one man operating two spindles. A full equipment of chucks is furnished for all sizes of unions from 3/8 to 2 inch pipe.

SALAMANDER COCK GREASE.

The manufacturer of brass goods finds it difficult to secure a suitable grease for greasing brass cocks. At first sight it would appear that any grease would do for securing a good tight fit and prevent the movable parts from sticking together. But there are peculiar conditions to be met. In the first place, after the cock is manufactured it is greased and put through the burnishing process. This develops so much heat that any ordinary grease will melt and run out. Consequently after burnishing every cock must be taken apart and regreased. Again, some greases become brittle when subjected to a low temperature. They should resist both heat and cold and should be free from fatty acids which would, after a time, cause slight corrosion and the rusting of the parts together. Some time ago this problem was thoroughly gone into by Carl A. Black, 1 Bratenahl Building, Cleveland, O., the result being the production of Black's Salamander Grease.

THE BRISTOL ELECTRIC FURNACE.

The new electric furnace recently brought out by William H. Bristol, 45 Vesey street, New York City, is remarkable for two reasons: first, its simplicity and, second, the short time required to bring it to the highest temperature. The ordinary electric furnace requires from ten to fifteen minutes to raise its temperature while this new furnace is brought to that degree in the same number of seconds.

The Bristol furnace consists of a fused quartz receptacle which is closed at one end to form a cup, or left open at both ends to form a cylinder, according to the use to which the furnace is to be put. About the quartz is wound one layer of platinum wire, each turn of which is insulated from the adjoining one by a cord or thread of asbestos. This construction constitutes

THE BRISTOL ELECTRIC FURNACE.

the heating chamber, and this chamber is embedded in refractory material like asbestos.

Since the coefficient of expansion of quartz is very low it may be heated or cooled rapidly without danger of cracking; for this reason the full current may be turned through the platinum at once and all rheostat regulation is done away with. The heating coil is selected according to the temperature desired. When heat up to 2,300 degrees is called for the quartz is wound with platinum wire and the furnace may be then used for hardening high speed steel. With temperatures in the neighborhood of 1,500 to 1,600 degrees nickel wire may be used in the coil. As shown in the engraving the furnace is arranged or wired for connection with the ordinary electric light lamp socket.

By passing articles blackened in the ammonia copper solution rapidly through the potash bath the color becomes clearer and acts as a set for the oxide. Small amounts of carbonate of soda added to the blacking solution prevent the brownish black coating from forming.

THE GREEN PLATING DYNAMO NO. 18.

The dynamos built by the W. Green Electric Company, 81 Nassau street, New York City, are particularly well adapted for gold, silver and nickel plating and coloring. Their new type here illustrated will do high grade electroplating at a speed of 1,600 revolutions per minute and a voltage of 2 to 10. The field is of the round type, bipolar of soft gray iron. Plenty of iron is used in the construction and the magnetic circuit is without joint. The bearings are long, about four times the diameter of the shaft, thus giving ample bearing surface. The shaft is of 5-16 steel, 7¼ inches long. The armature is a modified tunnel drum of 6 sections, 1¾ diameter, by

THE GREEN PLATING DYNAMO.

1½ inches long, and is well insulated with double cotton wire and shellaced. The commutator is 6 section and of ample carrying capacity. The brushes are of strip copper, ⅝ wide; they are long and springy and are held in slotted holders. The field coils are form-wound of double cotton wire, taped and shellaced.

The advantages are thus enumerated by the makers: For Roman coloring and plating the dynamo has many advantages over batteries as follows: Low price; cost to run from 1 to 2 cents per day; no solution or zincs to replace; connections do not corrode; certain to generate an even current of proper strength; insures a quick deposit and lasting color. All dynamos manufactured by this company are fully warranted.

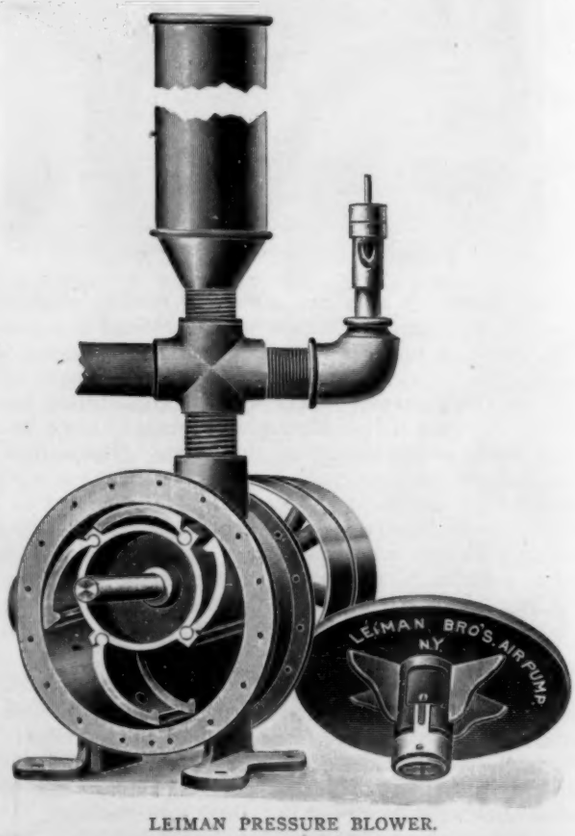
According to consular reports Manchuria abounds in minerals, especially in the northern part. These are principally gold, silver, copper, lead and iron. The large mines are operated by Chinese officials, but the smaller ones are controlled by native companies; the average annual output is $10,000,000. The gold found is in both quartz and placer form. In addition, the territory drained by the Huifaho and to the north of that river is exceedingly rich in gold, silver, copper, lead and coal.

WAX WIRE.

Attached to every package of "Wax Wire" sent out by Alfred Field & Company, of 93 Chambers street, New York City, are the words "Registered Trade-Mark." This distinguishes Wax Wire from a very close imitation which is now being sold. This imitation is but little more than the old paraffine wax taper, which carries a wick of considerable size, the wax being colored black and put up in continuous lengths. The value of the Lion brand wax wire lies in its flexibility under all temperatures. It readily adapts itself to the sinuosities of the most intricate core, and as it melts and disappears in the sand under the heat of the core oven it leaves the vent clean and clear. The small thread which carries the wax is consumed by contact with the heat from the molten metal. No instructions are required for the use of this wax wire—any core maker will understand how to apply it.

PRESSURE BLOWER AND SAND BLAST.

Less than three years ago Leiman Bros., of 139-143 Centre street, New York City, placed on the market the pressure blower which was patented June 14, 1904. Since that time it has become widely and favorably known. While very simple in construction it is powerful, durable and reliable. It is made in various sizes

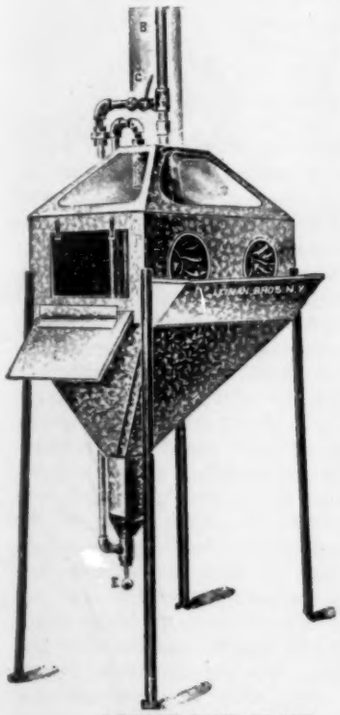


LEIMAN PRESSURE BLOWER.

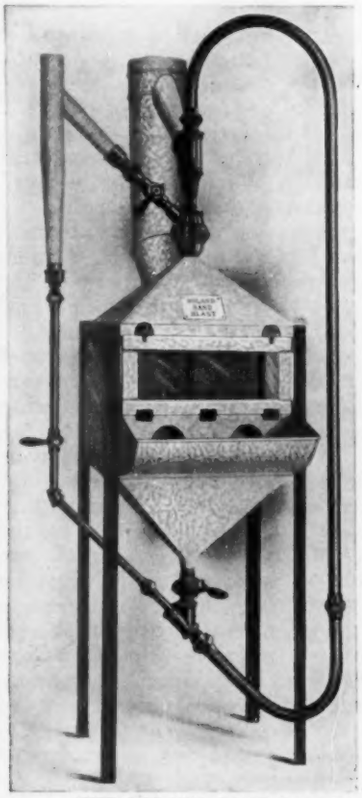
to meet different requirements and is adapted to a great variety of purposes, such as the melting of metals, annealing, brazing, soldering, forging, etc. Although primarily designed for the use of jewelers and metal workers, it is also adapted for service in heating and ventilating, glass blowing, atomizing, sand blasting, and the like. These blowers are sold complete with relief valve to regulate the pressure, an air reservoir and tight and loose pulleys. They are now

made in six sizes and additional sizes are soon to be added.

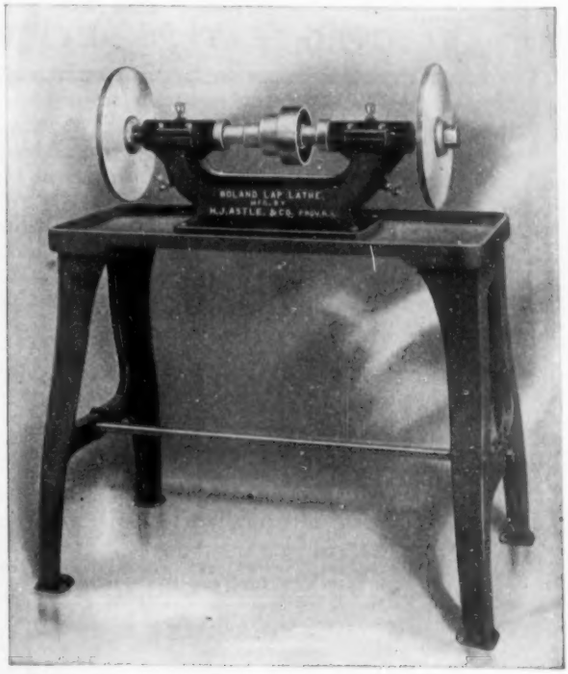
The firm also manufacture a continuous automatic feed sand blasting machine made of heavy galvanized sheet iron. Windows are placed in the top so that the operations can be watched. In the front are arm holes to which cloth sleeves are attached to protect the arms of the operator down to the wrists. Enough sand is placed in the machine to fill the small funnel-shaped holder at the bottom, from which it is drawn through the sand feed tube to the operating nozzle. A suction is created which draws the sand up to the operating nozzle or mixer where it is met by the air blast and forced on the work. The sand then passes down to the holder and is used over again. The tubes are all short and there is no danger of clogging. The machine takes up very little space, as the body only measures 18 by 24 inches.



LEIMAN SAND BLAST.



THE BOLAND SAND BLAST.



THE BOLAND LAP LATHE.

CONNECTICUT BRASS INTERESTS.

According to the report of the Connecticut Bureau of Labor Statistics, just issued, the returns from 85 brass manufacturing concerns—this does not include all the firms in the business—show that the gross value of the products for 1904 were $59,487,181; and for 1906 $85,189,903. The returns for 1905 are not given. This is an increase in the brass business of 43 per cent. The number of employees increased from 25,797 to 29,090, or 13 per cent. Since the report prints no names it is impossible to tell whether the returns include the American Brass Company or not.

The richest platinum deposits, where most of the platinum of the world come from, are in the Ural Mountains in Russia, and they have been worked under the supervision of the Russian Government since 1828.

THE BOLAND SAND BLAST AND LAP LATHE.

Two machines, known as the Boland, designed specially for the use of manufacturing jewelers, silversmiths, metal workers and platers, are shown in the accompanying engravings. They are built by H. J. Astle & Company, of Providence, R. I., who have been studying the needs of the above trades for a number of years and who aim to produce the machinery and appliances that are required.

The use of the sand blast in metal working establishments is becoming quite universal and the advantage claimed for the Boland type is that a pressure of from 10 to 90 pounds is obtainable, thereby increasing the scope of work that can be done with the blast.

The merits of the Boland lap lathe are the bearings and general design, which permit of smooth running. The oil, after lubricating the bearings, is carried down into a well and brought out of the way in order that it may not drag in any particles of emery. The wheels are of a lead alloy which is guaranteed to do the work. The purpose of the lap lathe is to fill up the pores of the metal and polish at the same time; it therefore acts like a burnisher. The emery used for this purpose is carried by the lead and the wheels are run at a very high speed.

The production of gold in the United States during the year 1906 is estimated by the Director of the mint at $96,101,000, which is an increase of $8,000,000 over that of 1905. The production of silver is estimated at $56,183,000 ounces, an increase of 82,000 ounces over that of the previous year.

During the year ending June 30, 1906, the United States imports amounted to $1,226,615,379 and the exports to $1,743,763,612. For the preceding year the imports and exports were $1,117,513,071 and $1,518,561,666.

EDITORIAL

OLD SERIES VOL. 13, NO. 3. NEW YORK, MARCH, 1907. NEW SERIES VOL. 5, NO. 3.

THE METAL INDUSTRY
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THE BRASS FOUNDER and FINISHER
AND
ELECTRO PLATERS REVIEW

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IS THERE DANGER OF A COPPER FAMINE?

If the large consumers of copper have placed their orders for deliveries months in the future, why do prices continue to advance steadily, and will the limit be reached soon, and after that will prices be maintained at the new figure or drop? The statement that the large consumers are stocked for six months—as is generally reported, but not universally believed—is received with considerable incredulity by those who claim to be in close touch with market conditions; that they would like to be so stocked is assumed as a self-evident proposition—that they actually are is information which they are not shouting from the house tops.

It is a sound, economic principle that abnormal advances in a brief period of time of any raw material which is a prime necessity in manufacturing industries are never permanent. The question of time enters as one of the most important factors in the problem. When prices have been adjusted upon a certain basis for raw material entering largely into the finished product, it requires time to make the readjustment of the prices of the product in order to keep pace with any unusual increase in the cost of the raw material. This task augments in difficulty in direct proportion to the magnitude of the business and the extent of its ramifications. A small producer making half a dozen articles can readjust his business and change prices over night. But to perform the same thing in the brass industry, with its vast variety and endless detail, requires time. As a matter of fact, copper has advanced over 30 per cent. in the past six months and yet brass manufacturers are to-day in a very large sized quandary as to prices. When fractions of a cent per pound are items demanding the most serious attention, and when changes are liable to occur at any moment, the brass industry is at sea both as to what prices now actually are, and can only guess at what they should be or may be 10 days hence.

For these reasons brass cannot advance as quickly as copper. Copper is a single article—brass is a composite article having copper as the foundation. The output of the first cannot be increased at will; and this simplicity makes it an easier question than that of brass with its intricacies.

We started with the proposition that an abnormally high price of a staple cannot be permanent. We believe the present price of copper may be so defined. It may and probably will go higher, but it will not reach a maximum and stay there; it is bound to fluctuate before becoming stationary. The present price has been created by legitimate trade demands mixed with a portion of the leaven of speculation. Differentiation here becomes a hard job, and not being in the confidence of any of the rings we shall not attempt its solution.

In a circular by F. H. Lovell & Co., of New York and Chicago, on the copper situation we find the following:

As regards articles manufactured directly from copper or from composition, many authorities regard the price of copper to-day as abnormally high. There is no doubt that this is so, but

the only question to decide is whether the position it holds is due to manipulation or whether it is the natural outcome of present and future trade conditions. In making a decision on this point it is well to remember, first, that the statistical position of copper is strong; second, the sentimental position is strong; and third that the actual position is strong. The visible supply of copper is less than it has ever been and the demand is greater than it has ever been. The demand is increasing at the rate of from 25 per cent. to 35 per cent. a year, while the output is apparently only increasing at the rate of from 5 per cent. to 10 per cent. This means a still further decrease in the visible supply with a consequent further strengthening of the copper situation. With the supply decreasing and the demand increasing it may not be long before famine conditions prevail.

This statement concerning the rate of increase in production of copper is in accordance with the census of manufacturers, 1905, United States. This shows that the output increased about 60 per cent. during the period from 1900 to 1905. But the visible supply has increased tremendously, and with the properties now developing in Utah and elsewhere in the West, and which will be productive enough to influence the market, we have no fear that "famine conditions" will prevail either in the near or distant future.

THE NEW YORK MACHINERY AND METAL CLUB.

It now appears that the efforts of F. H. Stillman, president of the Watson-Stillman Company, of New York City, to establish a machinery and metal club will reach a successful issue. Encouraging replies and promises of membership have been received from much over a hundred firms resident in the city, and from representatives of firms having their home offices outside the district. The machinery trade of New York City has been always concentrated about the Liberty and Cortlandt street district but this is the first attempt to bring the several interests together in more intimate and friendly relation. The hearty responses which have been received speak well for the future of the movement.

Last November Mr. Stillman sent letters to representative members of the trade and in the following month a meeting was held to discuss the plans. This resulted in the appointment of the following committee to canvass the situation, the companies acting through their executive officers:

The American Locomotive Company, the Morris Machine Company, the Ingersoll-Rand Company, the Frevert Machinery Company, the Prentiss Tool & Supply Company, the Watson-Stillman Company, the Railway Steel Spring Company, the Hoover, Owens, Reutschler Company, and the Franklin Boiler Works Company.

The new club will, according to present plans, have an active membership of 750, and provision will be made for a practically unlimited non-resident membership, so that all the leading manufacturers and dealers in machinery will be included in the club. It is probable that the membership will be confined to principals, chiefs of departments, engineer officers of the Army and Navy, etc. The initiation fee and annual dues will be in the neighborhood of $50.

Already much on the practical side of the undertaking has been accomplished. The machinery trade is flocking to the Hudson building, which will be ready for occupancy in about a year. This is one of the 22-story structures now being erected by the Hudson Companies at Fulton, Church and Cortlandt streets. Four floors have been engaged and it is the intention to take the two or three upper floors for the purposes of the club. A better location or one possessing more real advantages could not be found. Upon completion of the tunnels which are now well across the river there will be direct connection with the railroad lines entering Jersey City, and there will also be connection with both the present and projected subways and with the elevated and surface lines. These are merely the conveniences that would accrue from the occupancy of a building of this character and location.

Land in New York is too expensive for storage purposes; it is therefore the intention to obtain land in Jersey City, where it can be had for a comparatively small amount and there provide all the storage and show room capacity required by the supply and heavy machinery dealers. Communication between the offices in the Hudson building and the warehouse would be under cover the entire distance, and the time of transit would be only a few minutes.

Representatives of the non-ferrous metals are now scattered over the city; they no longer have even a neighborhood known as their district, as is the machinery district. It would seem that the project of the machinery men ought to appeal to them, and that it would be to their own advantage to join the movement. The leading metal houses are now in different sections, and practically have nothing in common. With offices in every way desirable and with more intimate connections with an important trade center—as we have no doubt the Hudson building will shortly become—their interests would certainly not suffer. And yet as far as we have learned the brass trade is not represented in the movement.

SYSTEM RUN MAD.

System is now one of the commandments of every large manufacturing concern, but even system can run mad. For instance, the Joseph Dixon Crucible Company, of Jersey City, N. J., received recently an inquiry from a million dollar firm asking the price and lowest cash discount on one No. 4 crucible, and whether the shipment would be F. O. B. New York or F. O. B. destination. For a moment the Dixon Company was paralyzed at the size of the order, but recovered and answered with as good grace as if the inquirer had asked prices on a carload, that, "Appreciating your inquiry of recent date, the net cash price for a No. 4 crucible F. O. B. New York is 40 cents. We await your further order." And in a few days, giving a long enough time for the reply system to work they received the order and thereupon made the shipment in regular form. Then the sellers began to figure on what the system cost, taking into account the postage, letter paper, dictator's time, stenographer's time and other people's time, an expense account of thirty-one cents could readily be made out for the order and inquiry, to say nothing of the manufacturer's cost of replies and shipment and all for a crucible which would hold about as much metal as a coffee cup.

PLATINUM IN RUSSIA.

In his report of the foreign trade of Russia for the year 1905, Consul-General Watts, of St. Petersburg, states that about 90 per cent of the total production of platinum comes from that country. The production is practically controlled by a French company, owning large mines in the Urals. An English company has secured large contracts from mine owners and producers to take their output for a term of years. The production is estimated as 23,291 pounds per annum, of which the United States in 1905 took 7,200 pounds; the United Kingdom, 6,695 pounds; Germany, 4,751 pounds, and France, 4,356 pounds.

CRITICISM AND COMMENT

WE CORDIALLY INVITE READERS' OPINIONS AND CRITICISMS OF ALL ARTICLES PUBLISHED IN THE METAL INDUSTRY. SUGGESTIONS WELCOME.

HEALTH OF BUFFERS AND POLISHERS.

To the Editor of THE METAL INDUSTRY:

In your issue of February, page 50, under heading "The Health of Buffers and Polishers," misstatements are made concerning machine polishing, unintentional, no doubt, yet so at variance with facts that we cannot allow them to pass without correction.

You state in your comments that, "Except on large and duplicate work of the simplest shape, machine polishing has not proved a success." Let us take you through one of the largest hollow metal-ware factories in the country, located within hearing distance of the writer's office. A short time since, upwards of one hundred buffers were employed in this factory. This firm was among the first to install automatic polishing machinery, which they have added to from time to time, and to-day with a much larger output than formerly less than fifty buffers are doing the entire work, including, as it does, a great variety of sizes and shapes.

A little further on we come to a large lantern and automobile lamp works. Here, in a room set apart for buffing, twelve automatic buffing machines are operated by three men, cutting down and polishing almost every piece contained in an automobile lamp, and the important part, from the firm's point of view, is the fact that these three men are turning out the same quantity and a better quality of work than it required fifteen men to do by hand.

Another instance, that of a large clock works, where our machines are installed for polishing clock cases. Experiments were made on mats, a very delicate piece of metal, and here they demonstrate that on such delicate work they did the work without injury to the shells, while by hand buffing a large number were destroyed.

We mention only these instances, as showing the large variety and sizes of work our machines are doing. We might also state that the call so far has been for machines equipped to do large work, but the use of improved chucks, and better attention from buffing-room foremen has made it possible to do a large variety of work on these same machines.

February 28, 1907. JONAS A. PARKER.

[In our editorial we said that mechanical polishing had been tried, but had not proved successful except on duplicate work. The merits of the discussion rest upon the word "duplicate." After reading the above we see no reason for changing the opinion expressed. Mechanical polishing can be carried on upon like pieces or pieces closely approaching the same pattern; but we do not know of a machine which will do good work on a cornet and then on a salver, except with readjustments that are expensive in the time consumed in making them. In other words, mechanical polishing is, as is well known, well adapted to the requirements of a concern producing standard articles in quantity, but is not so fitting in a jobbing shop where one job is finished before the next one comes in. We trust Mr. Parker will give us specimens of the work done on his machine and also a complete account of the machine itself.—Ed.]

ROYAL COPPER BY THE SALT PETER PROCESS.

To the Editor of THE METAL INDUSTRY:

In the correspondence department of your paper for February some reader has asked for a formula for producing royal copper by the saltpeter process. I would like to advise both the inquirer and others not to add water to melted saltpeter, as water and niter do not agree very well. If the water is added before the saltpeter is melted it will be of no benefit as it will evaporate before the niter is melted. To add water to melted saltpeter would be the same as throwing water into molten metal—it would cause somewhat of a disturbance to the operator, especially if he were not thoroughly acquainted with the process.

J. DIMES.

New York, February 22, 1907.

RECOVERING SILVER.

To the Editor of THE METAL INDUSTRY:

In removing the "fire coat" from sterling silver by dipping in nitric acid, the acid soon becomes rich in silver. This silver can be easily recovered in the following way: The chloride is first washed to free it from the muriatic acid, and then some strips of iron are placed in it and a dilute solution of sulphuric acid added. This will neutralize the chloride and reduce the fusion point. When the chloride has turned black wash free from acid and dry. Now place the neutralized silver in a large crucible and add an equal quantity of carbonate of potash and melt, starting the heat slowly and gradually raising the temperature. Care must be taken not to put too much into the crucible at one time or it will boil over. The silver, when melted, is allowed to remain in the crucible and chill, which will be in the form of a button. These buttons can be remelted and rolled for anodes or plate metal.

JOSEPH DIMES.

Practical Metal Turning. By Joseph G. Horner. 6 x 9 inches; illustrated; 400 pages. Norman W. Henley Publishing Company, New York. Price, $3.50.

In the preface the author states that while a great deal has been written on the use of the lathe, there has been no comprehensive work dealing with the present-day scope of turning in the large shops. While the minutiae of the subject has been omitted the matter is treated in a thorough manner in which no details of importance have been slurred. The principles and practice in the different branches of turning are considered, and well illustrated. Chucks of all the usual forms are shown, and many that are unusual. Considerable space is devoted to the modern turret lathe and the work done with it; this is particularly timely when we consider the field occupied by this tool in the duplication of parts. Thread cutting is also very fully treated, and the last chapter brings the book up to date by its treatment of the high speed steels and the work performed by them. The work is well and very thoroughly illustrated. A copious index provides for easy reference. There is one admirable feature about the book: it is not a treatise on machine tools in general; the author has confined himself to his subject—the lathe—and has let the rest of the field of mechanics alone.

CORRESPONDENCE

IN THIS DEPARTMENT WE WILL ANSWER QUESTIONS RELATING TO THE NON-FERROUS METALS AND ALLOYS. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

METALLURGICAL.

Q.—Please let me know how to make anodes out of old nickel scrap.

A.—In melting nickel scrap for the production of new anodes the best results are obtained when the metal is melted a second time. The flux should consist of nine parts of lime and one part fluor spar. Care should be exercised that the crucible is free from copper or brass, as a small quantity of copper will make an unsatisfactory anode. In remelting the metal add two or three pounds of tin to each 100 pounds of nickel just before pouring. This method will give you a good anode that will reduce easily and produce a white deposit.

Q.—Kindly send me receipt of solution for keeping the metal off the gate of a mold. There is some kind of solution with a mixture of liquid glass or something of that description which casters use.

A.—The formula consists only of silicate of soda, or as it is commonly termed, soluble water glass. This costs not more than ten cents per pound and is of the consistency of syrup. The mold should be quite hot, or after two or three castings have been taken therefrom. Then apply with a soft brush. A coating of glass will form, to which the metal will not adhere.

Q.—Could you give us the information as to what flux should be used in coating iron or steel with melted tin?

A.—The work must be first pickled in a mixture of one part muriatic acid to 16 parts water. If it is greasy or covered with paint use a hot solution of caustic soda previous to pickling. The flux used before dipping in the tin pot is chloride of zinc, made by dissolving scraps of zinc in muriatic acid. When a second tin pot is used it is covered with a half inch of melted tallow.—J. L. J.

Q.—Approximately what percentage of lead and zinc should be added in remelting sprues and gates of the following mixture in order to keep the same average: 65 pounds of copper, 31 pounds of zinc, 4 pounds lead with a 3 per cent loss in melting?

A.—There is more copper lost in melting a mixture like the above than is generally supposed. If you add 1 pound 2 ounces of zinc and 2 ounces lead you will keep your proportions approximately correct. Much depends on your shop practice. If the zinc and lead are put to the bottom of the crucible with a pair of tongs there will, of course, be very little lost by volatilization. J. L. J.

Q.—Can you help me out on the question of draft in my furnaces? The two are situated in a pit in a basement. They are of J. W. Paxson make, Nos. 5 and 3. I have the No. 5 connected direct with the chimney and the No. 3 connects with the pipe leading from the first. I melt with coal. I am unable to get three heats out of No. 5 before 7 or 8 o'clock in the evening. The fires are started first thing in the morning, and as soon as the heat is ready the pot goes right back in the furnace. I use all scrap metal. It has been suggested that I get an air compressor, and run a pipe to the chimney with about an ⅛-inch outlet, the same as on a steam furnace. My flue measures 8 x 12 inches and runs through three floors, about 50 feet high.

A.—We are of the opinion that if your draft were situated so that it would be equally distant between the two furnaces and on the same level, you would obtain better results. The draft connections should be built so they would form a V; this would insure the heat being the same on both furnaces. By adding 10 feet to the height of your chimney, by pipe or otherwise, you would find a wonderful difference and you might possibly avoid forced draft. If you should find it necessary to use it make your pipe in the shape of a triangle and leave two outlets about 3-16. Place this in a position so that the air pressure enters in the middle of the chimney. Exhaust steam could be used in place of air if you have it.—C. P. and W. J. R.

Q.—Will you be kind enough to give me the formula for mixing metals suitable for statuary bronze, also the method of finishing?

A.—A good mixture for statuary bronze is the following:

Copper, lake	128
Tin, Straits	8
Spelter	4
Lead	2

Sand blasting gives a pleasing finish for small articles. The above mixture gives castings which can be readily worked with a file or scraper, and on exposure to the weather soon assume the green patina or color desired in such objects.—J. L. J.

Q.—(1) What causes "spill" or splinters in copper wire when it is being drawn down on the bench and what can be done to prevent it? (2) Would the method of cleaning and pickling copper-alloy castings, published in the January issue, 1907, of THE METAL INDUSTRY, apply as well to copper wire—if not, what changes would be necessary?

A.—(1) Slivers in copper wire may be caused by dross, oxide, or other foreign matter in the wire bar, and may be looked for if remelted scrap is used for wire drawing. Use only new metal—electrolytic or lake. (2) The sulphuric acid pickle may be used for copper wire—1 part acid to 10 parts of water. Pour the acid into the water, not vice versa.—A. M. F.

Q.—We have your metal formula, namely 95 bertha spelter and 5 aluminum. At what temperature will it melt?

A.—The metal given will melt at from 900 to 1,000 degrees F., and be fluid enough for casting. Provision should be made to keep the molds suitably cool for the best results.

Q.—We want a special composition for a twine cutter. We have tried all the so-called babbitt metals, also different white metal compositions without complete success.

A.—We are of the opinion that a mixture consisting of 95 parts bertha spelter and 5 parts aluminum will give you a satisfactory metal for your purpose. This mixture can be cast in bronze molds and gives a good, strong and

close-grained casting. A little salammoniac should be used to cleanse the metal and bring the oxides to the surface. Probably one of the best and strongest mixtures for your purpose, if you care to use iron molds, is composed of copper 3 lbs., zinc 10 lbs., and aluminum 40 lbs. This gives a good, hard and dense metal.

Q.—What flux should be used in coating iron or steel with melted tin?

A.—A concentrated solution of chloride of zinc. This is prepared by dissolving sheet zinc in muriatic acid until the acid will take up no more; this will take about 24 hours.

Q.—In our work we have to cast a great many pieces from the same pattern and we are wondering if it would not be possible to get a metal mold of some description in which these could be cast and avoid setting up the flasks in sand.

A.—The Veeder Manufacturing Company, of Hartford, Conn., and the H. H. Franklin Manufacturing Company, of Syracuse, N. Y., control numerous patents for making finished castings in metal molds. The alloys used by them are white metals, which have lead or zinc as a base. Heavy castings, such as car brasses, have been cast more or less successfully in metal molds. For light castings, such a process could not be used unless the casting were done under pressure. The Smith pressure process has been used for very light art castings, but it is too expensive for ordinary work. Molds cut from acheson graphite have been used repeatedly in casting pure copper terminals around copper cables. Care has to be exercised in removing the castings from the mold if it is to be used over again.—J. L. J.

Q.—Kindly inform me whether you know of any method of stirring molten brass without bad effect. Some founders use iron rods and others a wooden stick. I have always recommended a green stick covered with black lead, but some parties claim that the stick gets charred under the lead.

A.—The best stirring rods for molten brass, especially if it is phosphorized, are made from Acheson graphite. This may be had in rods or slabs and cut into any desired lengths or shapes. The iron tongs used for holding the stirring rods need not be very heavy. Some of the makers of black lead crucibles supply stirring rods made of a mixture similar to that used in the crucible and reinforced with iron rods so as to prevent breakage.

J. L. J.

PLATING AND FINISHING.

Q.—I make a name plate with raised letters and black back ground; can you tell me how to finish it?

A.—One of the best dead black finishes for your purpose is a dead black japalac, which may be purchased at any paint store. Prepare your plates in the regular manner and then lacquer them with a transparent dip lacquer. When thoroughly dry apply the japalac with a soft brush. A little felt dipped in turpentine may be used for removing the black. This coating dries hard and will wear like paint.

Q.—I want a good gold solution.

A.—The Metal Industry answers questions in its columns absolutely free of charge. By referring to the index number published last December you will be able to find any article or question that was published during the year 1906. A good 14kt. gold solution can be made in the following way:

Phosphate of soda	6 ozs.
Bisulphite of soda	1 oz.
Cyanide of potassium	1 oz.
Carbonate of copper	2 dwts.
Chloride of gold	6 dwts.
Water	1 gal.

To prepare the solution dissolve the cyanide in part of the water; add the gold and copper. Mix the two salts in the balance of the water and then pour the liquids together. The temperature should be 160 degrees. A silver solution is prepared by dissolving 5 ozs. cyanide potassium in each gallon of water and adding 2½ ozs. chloride of silver and a few drops of ammonia. For nickel dissolve 8 ozs. double nickel salts, 1 oz. single nickel salts and 1 oz. common salt in each gallon of water.

Q.—What is meant by gold alloy flux, mentioned on page 302 of your December number?

A.—This flux is a composition specially made for china decorators for burning in metallic colors. It is also extensively employed with other compositions mentioned by silver deposit platers upon china and glass.

Q.—Will you give me the formula for ormolu acid dip on yellow brass?

A.—Dissolve 6 ounces sheet zinc in each gallon of 38% pale aqua fortis. When the solution becomes somewhat cool add an equal quantity of oil of vitriol to make up the quantity of dip desired. The dip should be placed in hot water to raise the temperature, and thoroughly stirred each time it is used. If the articles come from the dip too smooth add aqua fortis and a little salt. If too coarse add oil of vitriol. All articles should afterward pass through the bright dip for color.

Q.—(1) My copper solution plates brittle, black and streaked; it stands 18. (2) Please let me know what speed to run my polishing and buffing lathes on stove work?

A.—(1) Reduce your solution to 10 degrees with water. Then add 1 oz. carbonate of soda and 1 oz. bisulphate of soda to each gallon of solution. If necessary add ½ oz. to 1 oz. more cyanide to each gallon, but only if needed. The conductivity of your solution appears to be low; adding the soda salts will improve it. (2) The speed for emery wheel work is from 1,000 to 1,200 revolutions per minute. For buffing from 2,200 to 2,500 revolutions, according to the diameter of the buffs.

Q.—Will you kindly answer the following question? What difference does it make from an electrical and chemical standpoint whether, in arranging the wires for a plating tank, the rheostat is placed in the negative or cathode wire, or in the positive or anode wire? I notice most all works on that interesting subject advocate placing the rheostat in series on the cathode side, while a number of platers do the opposite. I am of the opinion there must be a reason for it, but if there is not, why do certain authors and dealers advise it?

A.—Theoretically it makes no difference whether the resistance is placed in circuit with the positive or negative connecting wires; some operators use one way and some the other. Practically, the resistance placed in circuit with the anode wire gives the best results, as the current passing through the anodes has a tendency to offer a greater resistance to the excess of current produced when other baths are in circuit. This is especially noticeable when the articles are

being removed from more than one bath at a time, and often saves burning or too rapid a deposit. This is most noticeable in nickel and silver solutions.

Q.—Please accept our sincere thanks for the brush brass finish; we have tried it with very good success. Will you further help us out with a good smoke finish on brass shells? We can't keep the smoke on shells when lacquering.

A.—The best method for producing the smoke finish is to first coat your shells with a thin coating of No. 1 extra copal varnish, thinned with turpentine. Apply your smoke while somewhat tacky; and afterward thoroughly dry. This will hold the smoke finish. A dip lacquer should be used, one composed of white French varnish cut in denatured alcohol would answer the purpose exceedingly well. Use 1 part of the varnish to 2 parts of denatured alcohol and 1 part fusel oil. Use 2 parts of the thinner to 1 part of the varnish. This gives an excellent body for smoke finishes, or you may use any other lacquer you may prefer.

Q.—(1) I am having trouble with my cyanide of copper solution. The work plates heavier in places and is coated with black streaks. The work is mostly cold rolled steel and I often have to replate in order to get a good copper color. I have used hyposulphite of soda, which helps a little. (2) What is generally used for spotting on plain copper plated plates that it is in appearance like spun spots?

A.—(1) Your solution is too concentrated; reduce it so it does not stand more than 10 degrees after adding to each gallon of solution ¾ ounce bisulphite soda and 1 ounce sal soda. This will increase the conductivity. Run very little free cyanide; it will work better. When it assumes a faint bluish tint you will know that there is not too much cyanide, which frequently causes spots. (2) Use a vertical lathe with a chuck. Use a piece of iron pipe in place of a drill and in one end place a piece of round soft rubber which should be tapered a little. Now use some powdered pumice on the rubber moistened with water. Bring up your plates against this and you will produce the spun spots you refer to.

Q.—Will you please give us a formula for a bright dip for brass castings?

A.—A very satisfactory bright dip may be produced in the following manner: To each gallon of pale aqua fortis add 1 gallon of oil of vitriol, 4 quarts of water and 6 to 8 ounces of rock salt. Prepare the dip some hours before using for the best results. When the dip needs replenishing use 1 part of vitriol and a little more than one-half part aqua fortis, but no more water.

Q.—(1) Please tell me how to get a nickel solution rich enough to plate basket work white without danger of the nickel salts crystallizing out. My nickel solution stands at 5½ B and then I have trouble with the salt crystallizing on the anodes. (2) Also please let me know what makes the cyanide of copper run streaked.

A.—(1) In plating nickel by the basket method an unusually strong current is necessary; this reduces more metal than is needed, and consequently the solution becomes too rich and the anodes become coated with crystals. Your only remedy is to increase the temperature of your solution in some manner. A single coil of lead pipe run through it would raise the temperature to 90 degrees or so and would allow the solution to become richer in metal without crystallization. Common salt added in the proportion of ½ to 1 ounce to the gallon of solution would improve the conductivity very much for basket work. (2) Your copper solution is too concentrated; reduce it to 9 degrees. Add equal parts of bisulphite of soda and sal soda in water to raise it to 10 degrees; this will overcome your trouble.

Q.—How can I produce a good brush brass finish on brass shells and tubing? I have trouble getting the shells free from brush marks.

A.—The best method to produce a brush brass finish is to use a brass machine scratch brush about 5 inches in diameter, 4 rows wide. The wire should be very fine and crimped so as to produce a very pliable brush. The speed should not exceed 1,000 revolutions per minute. To produce the finish cut your shells down with tripoli, potash and cyanide. Then go over them lightly with the scratch brush, using just a little pulverized pumice applied moist to the brush. Use a little washing soda in your water to keep it soft while brushing. Wash and dry out in the usual way. To avoid stains add a small amount of cream of tartar to your boiling rinsing water. Lacquer with a heavy dip lacquer.

Q.—Is there such a thing as alkali iron solution with which to obtain a soft black iron plate suitable for shading of old brass?

A.—Prepare a solution as follows:

Nickel sulphate	5 ozs.
Sal ammoniac	3 ozs.
Bisulphite of soda	½ oz.
Water	1 gal.

Add sufficient c. p. cyanide to clear the solution. Now prepare a concentrated solution of white arsenic in cyanide—1 lb. of the former to 2 lbs. of the latter in a half gallon of boiling water. Add sufficient of the mixture to the cyanide of nickel solution to give you a good black deposit. Use sheet brass anodes. This bath improves with age.

Q.—(1) What will produce a nice gray color, similar to antimony, on brass? (2) Also, what will produce a good brown on same metal?

A.—(1) Saturate a regular nickel solution with common salt and just flash your brass goods. It is best to deaden them on a brass scratch brush, using a little pumice stone; this gives a rather dark French gray effect. (2) Prepare your work as mentioned above; then immerse in a cold solution consisting of 1½ ozs. sulphuret of potash and ½ oz. water ammonia to 10 gallons of water. The first immersion produces a dark yellow. Dry out in boiling water and scratch brush dry, using a soft brush. Immerse momentarily for a second time when the color will be found to be a dark brown; it is not necessary to brush again. Dry out and lacquer in the usual manner.

Q.—How can oxidized or dull finish be produced on bronze car door trimmings?

A.—We are of the opinion that acid dips would not prove satisfactory for your purpose. A better method would be to produce a cut-down finish with tripoli; then clean the work and produce an old brush brass effect. This can be accomplished by using a dead soft crimped brass wire scratch brush, run at from 1,000 to 1,200 revolutions per minute. Moisten the brush with a little powdered pumice. Brush the articles lightly and a fine dead lustre will be the result. The brush should be about 5 inches, 4 rows wide. In your brush trough use water to which has been added a small amount of sal soda. Wash, dry and lacquer with a good body lacquer by dipping.

METALLURGICAL DIGEST

A REVIEW OF METALLURGICAL MATTERS OF THE WORLD.
TRANSLATED AND EDITED BY HOWARD GREEN BAYLES, MET. E.

A SIMPLE METHOD OF SILVERING BY MEANS OF A BATH.

(Translated from Der Metallarbeiter.)

The following method of silvering, which was invented by the well-known French galvano-metallurgist, M. Roseleur, gives the most satisfactory results of any so far devised. It is very easily managed, and although so simple, it seems to be comparatively little known among electroplaters. Without any trouble over an electric current, small brass or copper articles, such as pencils, nails, bolts, nuts, screws, hooks, and the like, can easily be given a silver finish.

The bath is made according to the following recipe:

22.5 liters, or say 5 gallons water.
.906 kg., or say 2 lbs. cyanide of potash.
.255 kg., or say 9 oz. silver nitrate.

Although the two salts can be dissolved together, it is preferable to dissolve them separately in a part of the water, mixing them subsequently.

The bath must be warm when used. Between 120° and 140° F. seems to give the best results. The cleaned articles, either in a basket or on strings, are immersed in this bath. Silver precipitates itself on their surface almost immediately and gives them a white coating of excellent character. If the article has a polished surface, the silver plate is likewise bright, and the plate on a matte surface is correspondingly dull.

The solution can not be strengthened by fresh additions, but must be used until exhausted and then run to waste. A new solution takes its place. Good results can not be attained by repeated additions of the salts

A bath prepared in this way is very satisfactory, and gives results which compare favorably in color and finish with electrolytic depositions. The plate produced is of course exceedingly thin, but good enough for many classes of work. A large number of articles can be plated before the solution is exhausted. As the silver is deposited, a corresponding amount of copper takes its place in the solution. This explains why additions of silver nitrate do not suffice to restore the solution to its full effectiveness. Where this is done, the deposit of silver becomes increasingly dark.

MAGNESIUM IN CASTINGS.

With the increasing growth in the brass foundry business has come a corresponding demand for perfect work. Assuming that the moulder has done his work well, the founder has to make castings free from blow-holes, flaws and imperfections. A large part of the trouble that exists is due to the fact that the melted metal tends to take up oxygen and other gases, which are later released on cooling.

This tendency may be entirely corrected by using as little as 1-20 of one per cent. of metallic magnesium. This extracts the oxygen from the bath and converts it into magnesia, which is removed in skimming just before the pour.

The method of introducing the magnesium is as follows: The small piece of metal is tied with the copper wire to the end of an iron rod ⅛" or ¼" diameter. The whole thing is then covered with a brasque made of clay and charcoal. This is thin over the magnesium and wire and thicker over the rod. In order to still further protect the iron and prevent the contamination of the bath by its solution, a second coat is given it of a thin graphite paste.

Shortly before the brass is ready to tap, the iron rod is heated as much as possible. To create a heat, however, would ignite the magnesium prematurely.

When the brass is in the pouring ladle the iron rod is plunged quickly in, and the metal is stirred so as to distribute the deoxidizing effect of the magnesium. The pouring is then completed as usual. It costs about 15 cents to refine 100 lbs. of brass by this means, and the perfection of the castings gained is worth many times this amount.

COPPER-PLATING ALUMINUM.

Aluminum is perhaps the most difficult metal to plate, as it seems to hold itself apart from other metals and refuses to conform to the rules that they obey. Some acids have no effect on aluminum. Clearing must be performed, therefore, either with benzine or, where the article has a matte surface, with a boiling solution of caustic soda. This is followed by a dip in nitric acid and rinsing in clear water. The most satisfactory coppering solution seems to be the one made after the following formula:

1 part copper sulphate.
1 part sodium bisulphate.
4 parts sodium phosphate.
50 parts water.

RECOVERING METALS.

"Metallurgic" gives, in its résumé of new processes of recovering metals from their ores, an illustration and description of a patent issued to John A. Gilman. It relates especially to the treatment of Pyrrhotite, a copper-nickel sulphide, and consists briefly of the following elements:

(1) A vessel from which fused sulphide is poured.
(2) A rotating sieve through which it is poured.
(3) A sprinkling device which keeps the sieve cold and wet.
(4) A tube or stack through which the drops of fused ore fall against a current of air.
(5) A strong steam and air blast which carries the solidified drops of ore into a chamber.

The basic idea evidently is that the ore, in its hot state and finely divided form, offers a large amount of surface to the desulphurizing action of an air current. If the ore has been fused, however, it does not seem as though this method would be as good as the old Bessemer copper convertor. No advantage seems to be sought or gained from the fact that the partly desulphurized matte is left in the form of shot.

We have at hand the first number (January, 1907) of a new monthly scientific magazine. Under the title of "Revue de l'Electrochimie et de l'Electrometallurgie," it takes as its particular field the rapidly growing applications of electricity, to the chemical and metallurgical industries.

Its contents have been carefully prepared by competent experts, and if the initial standard can be maintained it should be of interest and value to those engaged in electro-chemistry and metallurgy. The following main articles show its trend:

"The manufacture of nitric acid from the air by electro-chemical methods."

"The electric furnace in the laboratory and in industry" (a very comprehensive, short digest of history, progress and bibliography).

"Mechanical circuit breakers."

"The resistance of electrolytes to currents of high frequency."

"Physical-chemical constants."

There is also a review of progress during the past year and a list of technical papers read during the year before the French Academy of Sciences.

Professor Rydberg, of the University of Sund, has prepared a pamphlet in which he presents the theory of a single basic element which he calls "Elektron." He re-classifies the usual elements on the basis of the assumption that they are all atomic arrangements of a single substance. He studies its chemical and physical aspects and discusses the theory in its relations to astronomy.

A valuable work for those engaged in delicate analytical determinations is "Analyse des metaux par Electrolyse," by Hollard and Bertiaux. It represents the results of twelve years' experience and original research. Its greatest practical value lies in the fact that it has been prepared with the special idea of furnishing satisfactory methods for those analyses that were unduly difficult or inaccurate with wet or fire methods.

Associations and Societies

REPORTS OF THE PROCEEDINGS OF THE METAL TRADES ORGANIZATIONS.

ASSOCIATED FOUNDRY FOREMEN.—Frank C. Everitt, secretary, care J. L. Mott Iron Works, Trenton, N. J.

NEW ENGLAND MANUFACTURING JEWELERS' AND SILVERSMITHS' ASSOCIATION (Incorporated).—No. 42 Weybosset street, Providence, R. I.; William A. Copeland, president; H. M. Mays, secretary. The association works along the lines of everything for the betterment of the industry.

THE NATIONAL ASSOCIATION OF BRASS MANUFACTURERS.—President, E. F. Needecker; William M. Webster, commissioner, 1110 Schiller Building, Chicago, Ill. The National Association was formed for the betterment of trade conditions and a settlement of labor troubles. The association meets in different parts of the country in February, May, September and December.

THE METAL POLISHERS', BUFFERS', PLATERS', BRASS MOLDERS' AND BRASS AND SILVER WORKERS' INTERNATIONAL UNION OF NORTH AMERICA.—Headquarters, Room 409, Neave Building, Cincinnati, O.; president, A. D. Grout, Neave Building, Cincinnati, O.; general secretary and treasurer, Charles R. Atherton, Neave Building, Cincinnati, O. The objects of the society are to improve the condition of the workers in the industry.

AMERICAN BRASS FOUNDERS' ASSOCIATION.—President, Charles J. Caley, New Britain, Conn.; secretary, Richard Moldenke, Watchung, N. J. The formation of this society in connection with the American Foundrymen's Association was suggested at the last convention of the Foundrymen's Association, held in Cleveland, and the above officers were elected. Complete organization is to be perfected at the meeting of the American Brass Founders' Association, in May, at Philadelphia, Pa.

THE FOUNDRY SUPPLY ASSOCIATION.—President, S. T. Johnson; secretary, H. M. Lane, Schofield Building, Cleveland, O. The Foundry Supply Association is in a very thriving condition, the membership now numbering about 70, and the number of exhibitors at the Philadelphia convention of the American Foundrymen's Association having been greatly increased.

Arrangements have been made with the Otto Gas Engine Company and the Crocker-Wheeler Company for the installation of a 45 K.W. direct current generator, to be driven by a gas engine and furnish direct current at 220 volts pressure for exhibitors requiring this kind of current. The regular power current available at the Second Regiment Armory, where the exhibit will be held, is furnished by the Philadelphia Electric Company, and is alternating current, 220 volt, 60 cycle, 2-phase.

The fact that the interest in the Brass Founders' Association is increasing, and that there is evidently going to be a large attendance of those interested in the founding and the working of the non-ferrous metals, is bringing a large number of supply and equipment dealers who are especially interested in this class of equipment into the Supply Association, and it is evident that the exhibit will be unusually complete along these lines.

The secretary has recently made a trip through the East and spent considerable time in Philadelphia making necessary preliminary arrangements and looking after the interests of the members. In connection with this trip many of the exhibitors have stated what they expect to show, and it is evident that those who attend the Philadelphia Convention are going to have a rare treat, for the display will surpass anything of the kind thus far held and contain many novel and interesting features.

NEW YORK BRANCH ASSOCIATED FOUNDRY FOREMAN. President, Hugh McPhee, of Bridgeport, Conn.; secretary and treasurer, W. S. McQuillan, South Norwalk, Conn. The monthly meeting of this branch of the association was held on Saturday, March 2, at the Hotel Chelsea, with an attendance of 37. The main object of the meeting was for educational purposes and the development of good fellowship and closer relations between members. W. H. Perry, of the National Meter Company, New York City, spoke of the relation of the pattern shop to the foundry. Mr. Perry's remarks were mostly in regard to the troubles of the moulders, and the placing of the responsibility for bad castings, which might be caused by carelessness or imperfect patterns. His most important suggestion was that the pattern maker should first be a molder in order that he might appreciate the true requirements of the work. And then he would see that the patterns were made correctly and were in such shape that they could be molded. He criticised technical schools that turn out young fellows who know absolutely nothing about foundry practice. Mr. Simpson responded for Pratt Institute, and stated that a combination of lack of time and facilities prevents the giving of thorough and complete courses. Besides they did not pretend to turn out experienced and skilled men—they only tried to lay the foundation upon which to build the skilled workman afterward. Dr. Moldenke and Mr. Everett both spoke along these lines. Dr. Moldenke also spoke of the coming convention of the National Foundrymen's Association in Philadelphia in May.

ASSOCIATED FOUNDRY FOREMEN OF PHILADELPHIA. President W. A. Parrine, of the Abram Cox Stove Company; secretary, W. P. Cunningham, Pencoyd, Pa. The association's twenty-sixth meeting was held on March 11 and was largely attended. The theatre benefit to be given at the Grand Opera House, April 15 to 19, inclusive, was taken up for discussion and tickets were distributed; also quarters for the delegates to the American Foundry Foremen's Convention were secured.

THE AMERICAN BRASS FOUNDERS' ASSOCIATION. President, Charles J. Caley, New Britain, Conn.; secretary, Dr. Richard Moldenke, Watchung, N. J. Interest in this association is increasing as the time for the first meeting draws near. The time and place is Wednesday, May 22, 10 a. m., at the Second Regiment Armory in Philadelphia. The president and secretary will shortly talk over the plans for the launching of the organization, and as the definite programme is decided upon particulars will be given in these columns.

AMERICAN FOUNDRYMEN'S ASSOCIATION. President W. H. McFadden, Pittsburg, Pa.; secretary, Richard Moldenke, Watchung, N. J. The secretary announces that by invitation of the Philadelphia Foundrymen's Association, the next convention will be held in Philadelphia, May 21 to 24, 1907. The circular outlining the convention was present in the last issue of THE METAL INDUSTRY.

THE CLEVELAND CLUB OF ASSOCIATED PATTERNMAKER FOREMEN. Secretary, H. J. McCaslin. The regular meeting of the Cleveland Club of Associated Patternmaker Foremen was held in the office of H. M. Lane, 1137 Schofield Buildings, on Monday evening, March 11. There was an unusually large attendance, and one of the most profitable meetings that the club has thus far held. The club is preparing a joint paper to be presented to the American Foundrymen's Association at the Philadelphia convention, May 20 to 24. A number of members brought contributions for the paper, and these were then thoroughly discussed and many valuable suggestions made in connection with them. The matter was finally all gathered together and left in the hands of a committee who are to work it up and get the paper in final shape for presentation to the club at its next regular meeting Monday evening, April 8. The paper which the club presented to the A. F. A. last year on pattern shop equipment was very extensively discussed and reprinted in a large number of technical papers; and, judging from the work which is being spent on the present paper, it will also be worthy of the same consideration.

PERSONALS

ITEMS OF INTEREST TO THE INDIVIDUAL.

Edwin S. Cramp, vice-president of the William Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa., has resigned.

G. R. Stewart, president of the American Brass and Aluminum Works, Indianapolis, Ind., has been East the past month looking over the metal situation.

David D. Smith, New York agent of the Lanyon Zinc Company, died on February 9th at Nyack, N. Y. Mr. Smith had been ill for the past two months.

William A. Coleman, formerly manager of the Bristol Drug Company, Bristol, Conn., has accepted a position with the Coe Brass Company, of Ansonia, Conn., as chemist.

The annual meeting of the Chapman Valve Manufacturing Company, Indian Orchard, Mass., resulted in the election of the following: President, Edwin A. Carter; treasurer, Ralph W. Wight.

Hiland R. Farnsworth, manager since its incorporation of the Turner's Falls Machine Company, of Turner's Falls, Mass., has resigned to accept a position with the Union Machine Company, of Fitchburg, Mass.

John Sellers, Jr., a director of William Sellers & Company, Inc., and of the Midvale Steel Company, and of the Millbourne Mills Company, died at his home, Millbourne, near Philadelphia, Pa., December 14, in his 81st year.

At the annual meeting of the Reynolds-Chalou Foundry Company, of Troy, N. Y., the following officers were elected for the year: President, M. H. Fallon; vice-president and secretary, Joseph Mackey; treasurer, F. M. Brady.

C. K. Thomas, formerly general sales agent for the Lunkenheimer Company, of Cincinnati, O., has accepted a position with the D. T. Williams Valve Company, Cincinnati, as its Eastern sales agent, with headquarters at Cincinnati.

W. W. Hayden died in Newark, N. J., February 18, at the age of 55. Mr. Hayden was president and treasurer of the William W. Hayden Company, of 320 Fifth avenue, New York City, manufacturers of gold and silver novelties. He had been ill from grip for a long time.

At the annual meeting of the Lalance & Grosjean Manufacturing Company, New York, the following officers were elected: J. H. Walbridge, president; James Cochran, vice-president; James D. Fleming, second vice-president and treasurer; E. W. Ball, superintendent of factories.

Jos. Dimes has accepted the position of foreman in the plating room of Dominick & Haff, silver manufacturers, West Twenty-third street, New York. Heretofore the company has had a gilding room only, but will now be equipped with an up-to-date plating department with which they will do special work.

William P. DeWitt, secretary and treasurer of the New York Wire Cloth Company, 102 Chambers street, New York City, died at his home, 48 West Fifty-ninth street, on February 18. Mr. DeWitt was a son of Josiah Hornblower DeWitt, and a graduate of Stevens Institute. He was a member of the New York Yacht Club, the New York Athletic Club, the Players Club and the Hardware Club, among many others.

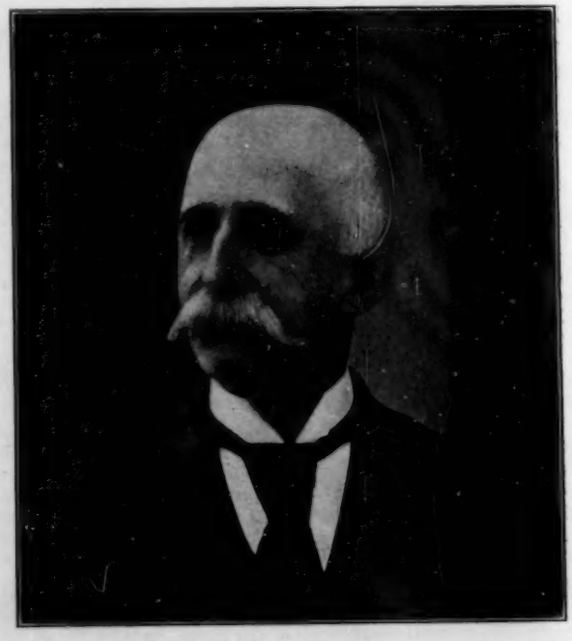
At the annual meeting of the Hendey Machine Company, of Torrington, Conn., builders of special machinery and tools, Frederick F. Fuessenich was elected president to succeed the late Henry J. Hendey. Charles H. Alford was prompted from secretary to vice-president and general manager, and Frederick N. McKenzie, who has been identified with the company for several years, was chosen secretary.

John A. Walker, vice-president and general manager of the Joseph Dixon Crucible Company, Jersey City, N. J., was appointed by Governor Stokes representative delegate from the State of New Jersey to the National Convention for the extension of the foreign commerce of the United States, held at Washington. The convention commenced January 14, and interesting accounts of the proceedings, written by Mr. Walker, may be expected in our esteemed contemporary "Graphite."

DAVID SCOTT PLUME.

David S. Plume, one of the prominent manufacturers of Waterbury, Conn., died February 19, after an illness extending from last December.

Mr. Plume was born in New Haven August 22, 1829, and when fifteen years old entered the office of a manufacturer of brass goods in Newark, N. J., to which city his family had removed. In 1852 he began business for himself in Newark, with a store in New York, and in this connection became acquainted with the brass interests of Connecticut. He was led to purchase an interest in the Thomas Company and in 1866 took charge of that business and removed to Thomaston with his family. That company was subsequently merged in the Plume & Atwood



DAVID S. PLUME.

Manufacturing Company and a branch was established in Waterbury. He was general manager of the company and held the position of treasurer until his death.

Mr. Plume represented the town in the Legislatures of 1877 and 1879, and also served four years as alderman. He was one of the original owners of the old horse railroad and later was president of the Waterbury Traction Company, which absorbed that company. He was also a member of the board of directors of the Waterbury Hotel Company. He was a member of the Union League Club of New York and the Home and Waterbury Clubs of Waterbury.

In addition to his connection with the Plume & Atwood Company he was treasurer of the American Ring Company, besides being president of the Colonial Trust Company, president of the Thomaston National Bank, a director of the Seth Thomas Clock Company, a director of the Phoenix Life Insurance Com-

pany, of Hartford, vice-president and a director of the Connecticut Railway & Lighting Company. He was also a director of the old New York & New England Railroad Company and the Naugatuck Railroad Company.

H. J. Lamborn has accepted the position of superintendent of power and plant in the Yale & Towne Manufacturing Company, Stamford, Conn., to succeed F. A. Waldron, who resigned about a year ago. The position is one of great responsibility and involves the supervision and frequently the designing of new buildings. The general repairs throughout the entire plant are in charge of the superintendent. Mr. Lamborn graduated from the Towne Scientific School of the University of Pennsylvania and has filled several important positions as a mechanical engineer.

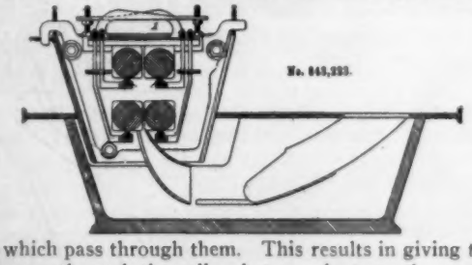
Simon Guggenheim, who has been elected Senator from Colorado, has severed with all the business concerns with which he has been connected. The most important of these were: The Western Mining Company of Leadville, Col.; the United Lead Company of New York, the Federal Lead Company of Missouri, the American Smelting & Refining Company of New York, the American Smelters' Securities Company of New York, and the American Smelters' Steamship Company. This removes from the copper interests, at least for the present, perhaps the most important figure connected with that industry.

At the annual meeting of the Haydenville Company, of Haydenville, Mass., manufacturers of brass and iron goods for water, steam and gas, the following officers and board of directors were elected: C. J. Hills, Haydenville, Mass., president; A. S. Hills, Haydenville, Mass., vice-president and treasurer; R. B. Hills, New York City, secretary; Richard W. Irwin, Northampton, Mass.; George L. Dayton, Jersey City, N. J. R. B. Hills, the new secretary, was formerly general manager of the Boston branch of the Crane Company; he will take charge, in place of C. K. Sanborn, of the office of the company at 150 Nassau street, New York City.

PATENTS

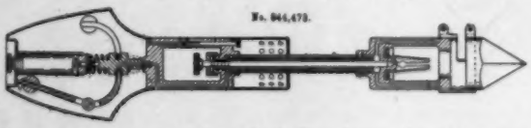
REVIEW OF CURRENT PATENTS OF INTEREST TO THE READERS OF THE METAL INDUSTRY.

843,223. February 5, 1907. Roll Wiper for Tinning Pots. Arthur James Maskrey, Chester, W. Va. In coating tin plates, the sheets are passed through a pot containing molten tin upon which floats a body of oil, the sheets being carried through the pot by a series of rolls. The discharge rolls are intended to squeeze from the sheet all superfluous coating. But these discharge rolls become thickly coated with the molten tin from the



sheets which pass through them. This results in giving the sheets as they pass through the rolls what may be termed a second coating; consequently a heavier coating is deposited than is necessary or desirable. This invention provides means for removing from the discharge rolls all scruff and excess of metal and prevents the molten metal from being carried into the nip as well as preventing any scruff from being deposited on the sheets by the rolls. This results in a finished plate being produced, having an even coating free from scruff and therefore brilliant.

844,473. February 19, 1907. Soldering Iron. William F. Ryan, Cincinnati, O. In this soldering iron the oil is fed readily to the burner regardless of the position in which the iron may be held and means are provided for keeping the oil passage free from

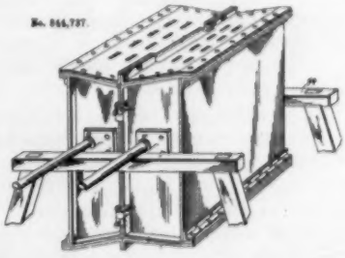


clogging. After a pressure of air has been placed in the tank a needle valve is opened and a small amount of oil drops into the ignition cup, where it is ignited. This vaporizes the oil in the heating chamber, and this vapor is used in heating the iron. Provision is made so that the device can be used as a torch.

844,688. February 19, 1907. Die and Pattern Making Machine. Frank P. Pfleghar, of New Haven, Conn. This machine is so designed that it will accurately cut a die or pattern up to the mark, whatever its shape may be. It has been common to cut a die or pattern up to the mark with a file in the hands of the operator, and no matter how great the care exercised there is always a tendency of the file to rock and then the mark is liable to be over-reached. This danger is further increased by the fact that in many cases the mark is more or less concealed by the file. In this machine the work is clamped upon a table which may be moved in any direction required to bring the work in contact with the cutting tool. In this manner the cutting proceeds without any danger of overreaching the mark.

844,460. February 19, 1907. Casting Machine. Bernard T. McGlone, of Chicago, Ill., and George Ross, of Hammond, Ill. This casting machine is particularly intended for the production of bushings and similar articles. The device is of simple and durable constructon and can be operated at comparatively high speed. The articles can be removed from the mold as soon as they have set and can be formed with cores when necessary.

844,737. February 19, 1907. Molding Apparatus. George F. McKee and William F. Schilling, of Aspinwall, Pa. This invention provides a novel form of flask for molds, which will permit of the sand of the flask being used a number of times for castings. Heretofore it has been impossible to use the sand formation of a flask for another casting, the removal of the casting either

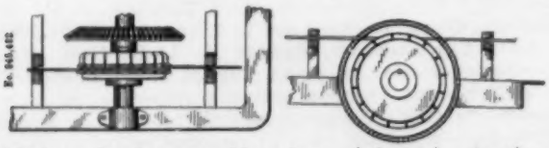


disfiguring the sand formation or the character of the sand requiring that it be repacked before it can be used again. This invention provides a flask so constructed that the sand formation may be removed from the casting and used again in the production of another casting. There is also provided a novel form of gate which is particularly adapted to be used in connection with this flask. These gates permit two part flasks being readily opened and the castings removed without in any way disfiguring the sand formation.

844,169. February 12, 1907. Casting Machine. William A. McAdams, New York City. This machine is intended particularly for casting aluminum alloys in the form of a continuous bar or rod, although the main body of the machine may be utilized to advantage in connection with other forms and arrangements of molds. The metal can be introduced into the furnace while the melting is going on so as to keep a constant supply of molten

metal. The molten metal is automatically discharged and forced into the die by fluid pressure in such a manner as to maintain a continuous outgoing stream, which is cooled and carried on in the form of a bar or rod without interruption. Means are also provided for converting the overflow from the furnace, in case the molten metal accumulates therein above a certain predetermined level, into ingots of such size and shape that they may be again introduced into the furnace.

845,462. February 26, 1907. Wire Drawing Machine. William J. Herald, Hamilton, Ontario, Canada. The main object

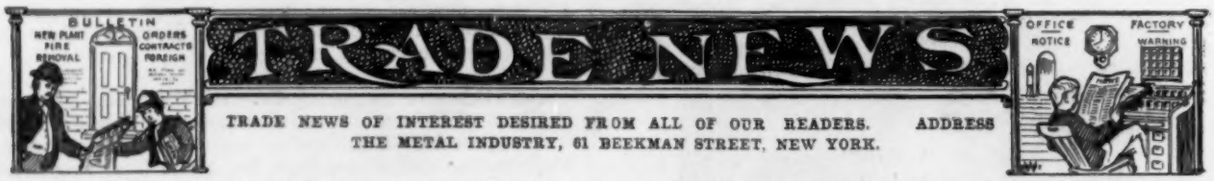


of this invention is to provide a form of drum for drawing the wire whereby all slipping or abrasion of the wire will be eliminated, no matter what variation there may be in the speed or call of the wire within certain limits. The invention also provides for wet or dry drawing from one die to the other with a minimum amount of pull, and in which any slip will not result in the wire contracting. The drum of the machine is slitted through the face and periphery radially and axially and is made of spring metal. The drive is through a friction gear.

843,321. February 5, 1907. Electroplating Apparatus. Herman R. Rossier, Great Neck, N. Y. This invention relates to an apparatus for electrodepositing metals, and the main object is to provide a device for producing a uniform deposit or plating. The receptacle containing the articles is given a peculiar motion which is responsible for the uniformity of the deposit. The receptacle is mounted on a shaft which is given a conical movement, the lower end of the shaft resting upon the bottom of the bath. This insures the constant changing of the position of the receptacle carrying the articles and provides for the even coating with the metal of the bath.

845,278. February 26, 1907. Relish Set. Fred Theil, Chicago, Ill. This arrangement provides a single receptacle for the small dishes and numerous accessories of an elaborate dinner or banquet, including the menu card, designation card for guests, buttonhole bouquet and other articles, and enables the servant to place and remove them as one article. The set is in the form of the arc of a circle.

845,514. February 26, 1907. Die Stock and Operating Device. William V. Bulman, of Philadelphia, Pa. This is a device for holding and operating pipe and bolt threading die stocks. It is particularly intended for use in connection with large die stocks; and its object is to enable such stocks to be readily manipulated by one man. The device can be operated right or left hand, and the hand lever can be operated from any side of the holder, thus permitting the use of the stock in corners and close to walls, and to be easily manipulated in many positions where it would be almost impracticable or very difficult to operate it in the ordinary way. It can be also used for operating pipe cutting stocks and internal or external threading die stocks and pipe or bolt threading die stocks.



TRADE NEWS OF INTEREST DESIRED FROM ALL OF OUR READERS. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

The Willson Aluminum Company, formerly at 99 Cedar street, New York City, have removed to 79 Wall street.

The Racquette Foundry & Supply Company, of Albany, N. Y., brass founders and finishers, will erect two brick buildings 50 by 100 feet.

The Goldschmidt Thermit Company, of 43 Exchange place, will move their offices to the skyscraper office building just completed at 90 West street, on or about April 1.

A new electric generator for electroplating has been brought out by the Chas. J. Bogue Electric Company, of 213 Centre street, New York City. The current is 8,000 amperes and 5 volts.

The Eastern Carolina Silver Company, of Hartsville, S. C., has been organized for the purpose of manufacturing silver ware and is now in the market for machinery and supplies.

Bertuch & Company, Temple Court, New York City, who supplied the Denver Mint with earthenware and porcelain equipment, have received a similar order to supply the San Francisco Mint.

MacKellar's prepared charcoal for brass founders is sold by R. MacKellar's Sons Company, proprietors of the Peekskill Facing Mills, Peekskill, N. Y. Established 1844 and incorporated in 1902.

The Findeisen & Kropf Manufacturing Company, of Chicago, Ill., have purchased four furnaces from Alfred Fisher, 103-105-107 West Monroe street, Chicago, manufacturer of crucible fuel oil metal melting furnaces.

Edward Miller & Company, Meriden, Conn., makers of lamps, have rented two large stores at 78-80 Warren street, New York City, for the display of their new line of gas, electric and combination gas and electric fixtures.

S. Birkenstein & Sons, proprietors of the Globe Metal Company, Chicago, Ill., announce that they are in the market for new and old metals of every description and also carry a complete line of foundry supplies and sell ingot brass.

The Pilling Brass Company, of Waterbury, Conn., a new concern, announce that they make a specialty of platers' metal and also sell brass and German silver 6-inch and narrower and .005 gauge and thinner.

The Camden Anchor-Rockland Machine Company, of Camden, Maine, have moved into their new and commodious quarters. The company still maintains its Rockland store, where it carries a full line of engines, parts and supplies.

The Kenworthy Engineering Company, of Waterbury, Conn., announce that they have recently received several large orders for their dross and copper refining furnaces.

The Elkhart Brass Manufacturing Company, of Elkhart, Ind., recently received the largest single order in their history, and it probably takes precedence over any order in the trade in general. It was for hose brasses, and aggregated $8,900.

The Langsenkamp-Wheeler Brass Works, of Indianapolis, Ind., are erecting a new power house, which will be part of the new factory now building by the company. The power house will be of reinforced concrete, one story high and will cost $8,000.

The S. Obermayer Company have let contracts for large improvements for their Cincinnati plant. This will consist of a two story brick building 75 by 75, to be used for manufacturing purposes. The company are installing a 500 horse power engine with improved rope drive.

M. T. Moore, former proprietor of the Syracuse Plating Works, of Syracuse, N. Y., after taking a year's vacation, has

repurchased his former plant of that city and is now making extensive improvements and is putting in additional facilities for doing all kinds of plating.

The following notes were sent by our correspondent from Taunton, Mass. The Cohasset Silver Company have just put in a new melting and casting room as their business has increased very rapidly and they were crowded. The Reed & Barton new foundry is now in full operation.

The Metals Extraction and Refining Company, 428 N. Halstead street, Chicago, Ill., are making extensive improvements in their plant and are installing three new furnaces. They announce that they have a special process for extracting and refining copper, brass, tin, solder, lead and spelter residues.

The Bates & Peard Annealing Furnace Company, Liverpool, England, have contracted with the Isbell-Porter Company, founders and machine works, Newark, N. J., for the sole manufacture of their bright annealing furnaces for non-ferrous metals. C. M. Dally, of 29 Broadway, New York City, will continue as sales agent.

The Crescent Gas Fixture & Art Metal Company, Bridgeton, N. J., recently changed its corporate name to the Crescent Art Metal Company. Their plant is now occupied to its fullest capacity in the manufacture of the better grades of lighting fixtures. The company have their own foundry, metal working shops and plating room.

The Boston Nickel Plating Company, 150-160 Portland street, Boston, Mass., have enlarged, remodeled and added new lines, and are now prepared to handle metal finishes for nickel, brass, bronze, black nickel, copper and silver plating. This company now has one of the largest job shops of the kind in New England, if not in the United States.

The Mogul Metal Company, of Detroit, Mich., makers of babbitt metals, have closed a contract for their new plant, which will be located at 159 and 161 West Larned street. It will be finished and equipped by the 1st of April. At present the company are far behind in their orders, but with the new plant they will be in position to take care of their rapidly growing business.

The Northern Indiana Brass Company, of Elkhart, Ind., founders and finishers and makers of castings in brass, bronze, copper, aluminum and gun metal, are extremely busy, although the company has been organized but little more than a year. Their specialty is the making of musical instrument castings, and they are now doing much work in German silver keys, mouth pieces and anything required on a horn.

The Easton Polishing Supply Company, of Easton, Pa., are now making a specialty of wood leather-covered wheels, canvas wheels, and different grades of leather wheels, and are also in a position to handle large orders for emery, as they have their own mill for manufacturing the emery, as well as taking care of all orders for emery paste, and other grades of polishing compounds.

The Central Brass Manufacturing Company, of Cleveland, Ohio, manufacturers of high grade brass goods for plumbers and water works, announce that Henry Gleichman has been appointed representative for New York City and vicinity. Mr. Gleichman, who has had many years' experience in the line, will look after the wants of the company's trade in his territory in the same efficient manner which has gained their prominence.

The Falcon Bronze Company, of Youngstown, Ohio, has been reorganized, Gus A. Doerright, who is now president and general manager, having bought out the interests of Richard Gralick, John Tod and W. W. Bonnell. The company is capitalized at $25,000 and does a large business in manufacturing bronze and brass castings and fittings. Mr. Doerright has been the active manager of the business from the beginning.

The Barlow Manufacturing Company, of Holyoke, Mass., have decided to build a four-story brick mill to accommodate their growing needs. Their present plant has for some time been greatly overtaxed, and a substantial addition became imperative. The firm manufactures nickel and brass display fixtures for stores and windows for every kind of business. Their goods are sent to all parts of the United States, and the foreign market is extending rapidly.

The Salo Art Metal Company, of 462 East 136th street, New York City, manufacturers of artistic metal goods and etched metal novelties, are building a new plant in Binghamton, N. Y., which will triple their capacity. This the company was compelled to do as they had far outgrown their present quarters. The company will retain their New York show room, where they will be represented by Max Herbert.

The James A. Spargo Wire Company, of Rome, New York, manufacturers of bare and tinned copper wire, have purchased 12 acres of land in Rome, situated on the New York Central tracks, and have let contracts for one building, 100 by 300 feet, steel and concrete construction, one story high. Their business has grown so rapidly that the present plant, although run night and day, was unable to keep up with the orders.

J. C. Black & Co., Keene, N. H., have taken over the business of the Humphrey Machine Company of that city and are prepared to build and install the Humphrey turbines, to install the McCormick wheels and take contracts for complete water power plants. Mr. Black has had an experience of 25 years in this line of work and is an authority on the subject. The company is fully equipped for making repairs for these wheels.

The Glens Falls Machine Works will erect a fireproof steel and brick building at Glens Falls, N. Y., 75 by 115 feet. It will be equipped with the most modern tools, and the total cost will be in the neighborhood of $40,000. The capitalization of the company is $63,000. The company was formerly known as the Moore Screen Company, of Sandy Hill, N. Y. The officers of the company are: W. W. Wells, president; A. R. Paull, of Utica, vice-president; Andrew Tromblee, of Carthage, secretary and treasurer.

C. J. Nikolas & Co., of 400 West Van Buren street, Chicago, Ill., extend a cordial invitation to every one who is interested in lacquers to visit their new factory, which the firm says is the largest and finest equipped lacquer plant in the world. The equipment also includes complete apparatus for distilling and refining ether and spirits. Before building the factory Mr. Nikolas studied the lacquer shops of Europe and America, and believes he has made an improvement on all others. The building occupies 14,000 square feet of floor space, and is divided by fireproof walls and doors.

The Elkhart Brass Manufacturing Company, of Elkhart, Ind., is now running to its fullest capacity, and is several months behind in its orders. The products consist of all kinds of brass supplies for fire departments, plumbing and automobile parts. There are also special departments, such as enameling, plating and pattern. A considerable portion of the work is on special orders. The company is composed of A. E. Hansen, president and manager; W. H. Anderson, secretary and treasurer, and Louis Anderson, superintendent.

The progressive policy of Leiman Bros., of 139-143 Centre street, New York City, is well illustrated by the fact that they were recently compelled to erect a new manufacturing building plant in Newark, N. J. The building is of reinforced concrete construction throughout, with nothing of wood in it. It is not only absolutely fireproof, but is much better able to stand the strain of a large machinery manufacturing business such as this firm enjoys. The firm makes metal workers' specialties, jewelers' work benches, pressure blowers and sand blasts.

The Federal Bronze & Brass Company have purchased several lots in Astoria, N. Y., and will erect thereon a large manufacturing plant. Plans are now being drawn by their own office force, and it is expected to have the building ready for occupancy in two or three months. The firm manufactures a very high grade of architectural bronze and brass work. The Night and Day Bank, at Fourty-fourth street and Fifth avenue, New York City, is one of their latest jobs, and well illustrates the high character of their craftsmanship. The officers of the company are: Wm. K. Waterman, president, and Edward H. Antonius, vice-president and treasurer.

The annual meeting of the stockholders of the Bristol Brass Company was held January 30. Directors for the coming year were elected as follows: Pierce N. Welch and Henry F. English of New Haven; Charles Terry Treadway, Julian R. Holley, George W. Mitchell, Samuel B. Harper and Judge Roger S. Newell of Bristol; Dean Welch of New York and Charles W. Gross of Hartford. At the meeting of the directors later the following officers were chosen: President, Pierce N. Welch of New Haven; vice-president, Julian R. Holley; secretary, Samuel B. Harper; treasurer and general manager, Julian R. Holley.

The Meaker Company, of 44 to 50 North Elizabeth street, Chicago, Ill., have perfected a process for coating iron, steel, copper and other metals with tin, which produces a coating of great evenness and brightness. The process involves the use of electricity, and its perfection is well illustrated by the fact that sheets having four or five hundred perforations to the square inch can be coated without closing the holes. The same company have perfected an electrolytic zinc coating process by means of which coatings one-eighth of an inch can be obtained perfectly smooth and with a lustre equal to the best hot galvanizing. Under the microscope this coating appears non-crystalline and dense, and as though spread on the metal with a smooth tool.

The Yale & Towne Manufacuring Company have awarded contracts for building extensions to their press and cabinet lock departments at Stamford, Conn. This press shop extension will be one story high, approximately 80 feet by 156 feet, resting on 40-foot piles, with brick walls and timber roof with saw-tooth skylights. The floor will be of reinforced concrete, designed for a live load of 250 pounds. The cabinet lock department extension will be one story high, 42 feet by 80 feet, of wood construction with gravel roof; and concrete foundation and retaining wall. The work will cost about $40,000 and is to be pushed forward as rapidly as possible after the inception of milder weather.

The Central Brass Manufacturing Company, of Cleveland, Ohio, announces that M. W. Heller, who for many years past has been associated with some of the largest mercantile and financial institutions of the city of Cleveland, has been elected president and will take an active part in the management of the corporation. E. L. Strauss, vice-president, when interviewed some time ago, stated that the increased business of the past few months has been unprecedented, and will necessitate the re-erection of another new large building in the near future. He states, "Not only has our business in the old line of staples increased, but we have met with an unlooked-for demand in our new specialties, viz.: Cleveland Refrigerator Traps, Adjustable Waste and Overflows, and the Compression Stop and Waste Valve. If things keep up as they are going, we shall have to double our capacity before the end of this year."

The eighth annual meeting of the stockholders of the American Brass Company was held at their office in Waterbury, Conn., February 26. There were voted 86,919 shares of stock out of the total of 100,000. The directors chosen for the ensuing year were: C. F. Brooker, A. A. Cowles, J. S. Elton, A. C. James, C. N. Wayland, C. H. Dodge, J. A. Doughty, J. P. Elton, E. T. Coe, E. L. Frisbie, Jr., G. W. Burnham, T. B. Burnham, T. B. Kent, Edward Holbrook and John J. Sinclair. Following the annual meeting there was a special meeting of the stockholders to act upon the recommendation of the board of directors to increase the capital stock from $12,500,000 to $15,000,000. The meeting adopted the recommendation and the capital stock was increased as proposed. On May 1 the increase in stock made a year ago from $10,000,000 to $12,500,000 matures and on maturity of the last increase the present increase will take effect and the capital stock will then be $15,000,000, to date from July 1, 1907; but it will participate in the dividends of the company payable August 1, 1907. At the annual meeting of the board of directors the following officers were elected: President, C. F. Brooker; first vice-president, E. L. Frisbie, Jr.; second vice-president, A. A. Cowles; third vice-president, James S. Elton; treasurer, John P. Elton; secretary, Gordon W. Burnham; assistant secretary, James A. Doughty; transfer agent, Gordon W. Burnham; general superintendent, A. P. Hine.

FIRES.

The fire which destroyed one of the factory buildings of the Wire & Telephone Company of America, at Rome, N. Y., on February 23, will in no way interfere with their taking care of the requirements of their trade as heretofore. Owing to their resourcefulness and quick action, every provision was soon made to make deliveries and to accept new business on all their products. The fire, which only destroyed the wire-drawing plant, was no sooner under control than arrangements were being made for the drawing of their wire by other mills. Their representatives were instructed to accept orders and assure customers of deliveries as though they had not had the misfortune of a fire loss. Contracts have already been let for the erection of a new wire-drawing plant, which will be pushed to the earliest possible completion.

INCORPORATIONS.

The Ohio Brass & Copper Company, Cincinnati, O., has increased its capital from $5,000 to $15,000.

The Burlington Brass Works, Burlington, N. J., have increased their capital from $30,000 to $50,000.

The Colonial Brass Company, of New Haven, Conn., has been incorporated with a capital of $10,000, by F. H. Page, C. D. Page and A. C. Stowe.

The Torrington Manufacturing Company, of Torrington, Conn., makers of brass and iron products, have doubled their capital, increasing it to $120,000.

Rice & Company, Lowell, Mass., makers of wire specialties, have incorporated with a capital of $25,000. The officers are Frank H. Haynes, president; Virgil G. Barnard, treasurer, and George D. Hawley, clerk, of Lowell.

The Pacific Platinum Company has been incorporated by Theodore R. Heintz and H. F. Lange, of Berkeley, and A. S. Macdoncald, of Oakland, Cal. The capital is $1,000,000. The headquarters are in Oakland.

The J. H. McGafferty Company has been incorporated with a capital of $100,000, for manufacturing iron and brass. The incorporators are J. H. McGafferty, of Boston, Mass., president, and T. F. Haunnett, Newton, Mass., treasurer.

The D. E. Haven Manufacturing Company, of Brooklyn, N. Y., has been chartered with a capital of $400,000 to deal in iron, steel and copper specialties. The directors are: E. A. W. Murray, Edward B. Thompson and J. M. Fiero, Jr., New York City.

The Myers & Force Company, of East Orange, N. J., has been incorporated with a capital of $50,000, to manufacture metal novelties in brass, German silver, aluminum, etc. The incorporators are L. A. Myers, Jr., J. W. Force, and William L. Myers, of East Orange, N. J.

The Williams Metal Stamping Company has been incorporated at Buffalo, N. Y., with a capital of $10,000, to manufacture sheet metal specialties and all kinds of stamped work. An equipment of presses and stamping machinery is being ordered. Chas. Hoyt Williams is the president and treasurer of the company.

The Sanitary Can Company, of Fairport, N. Y., has been incorporated with a capital of $1,000,000, to manufacture tin cans and tin containers. The directors are Y. Bogle, of Montclair, N. J.; George W. Cobb, of Fairport; Frederick D. H. Cobb, of Richester, N. Y.; Charles M. Ames, of Mount Vernon, N. Y., and Henry F. C. Killan, of New York City.

A company, to be known as the American Galvanizing Company, with a capital of $1,200,000, is now in course of formation by H. W. Poor & Company, 33 Wall street, New York City. It is claimed that the process affects a saving of about 50 per cent. in the cost of galvanizing, this figure being based upon the re-

sults obtained at works now in operation in England and Germany.

The Victor Metals Company, of East Braintree, Mass., manufacturers of non-corrosive metals, manganese bronze, bronze and anti-friction metal, has been incorporated with a capital of $150,000—$100,000 common stock and $50,000 in 6 per cent. cumulative preferred stock. The incorporators are: Victor C. Lassen, East Braintree; Isaac Chase, Cambridge, Mass.; Joseph Chase, Jr., Weymouth, Mass.; Atherton N. Hunt, Boston, Mass., and A. B. Macee, Dover, Del.

Papers of incorporation have been filed at Albany, N. Y., of the Buffalo Copper & Brass Rolling Mill, Buffalo, N. Y. Capital, $800,000. Directors: R. L. Fryer, G. A. Ray and E. R. Thomas. Geo. A. Ray is the president of the Geo. A. Ray Manufacturing Company, of 1490 Niagara street, Buffalo, manufacturers of metal goods and has had under consideration for some time the establishment of a rolling mill.

PRINTED MATTER

METAL FURNITURE. A neat folder has been prepared by the Ohnstrand Metal Furniture Company, of Jamestown, N. Y., dealing with their metal furniture.

FIRE CLAY AND BRICK. Printed matter received from the Laclede Fire Brick Manufacturing Company, of St. Louis, Mo., deals with their very extensive line of clay vitrified products.

WATER WHEEL.—We have received from the Pelton Water Wheel Company, of San Francisco, Cal., a large catalogue of over 100 pages dealing with their different patterns of water wheels. These wheels are noted for their efficiency.

PARTAMOL.—A circular by the Partamol Company, 415 Broadway, New York City, mentions many of the uses of this parting material and shows the advantages of such use. This prevents the sand sticking to the pattern, and consequently produces a sharp, clean and perfect mold.

ELECTROPLATING OUTFITS.—A price list has been received from G. S. Williams, Cincinnati, O., giving some of the electroplating articles handled by them and the prices. This company not only provides all the material required in a plating plant, but is ready to furnish the entire equipment.

ELECTRO-PLATING DYNAMOS.—We have received from the Jantz & Leist Electric Company, of Cincinnati, O., a very fine set of half-tone engravings showing their motor and belt driven dynamos for electrotypers, platers and general deposition of metals.

CRUCIBLES.—A blotter by the Waterbury Crucible Company, of Waterbury, Conn., presents a fine view of a portion of their large line of crucibles. Under the engraving is the statement that "We are not trying to make our crucibles to conform to low prices, but we are concentrating all our efforts to make the best crucibles."

CHAFING DISHES.—A folder by S. Sternau & Company, Broadway and Park Place, New York City, mentions their white enameled food pan with removable nickel plated rim. In the ordinary dish the food accumulates between the enameled pan and the rim and sours. With the removable rim this unsanitary feature is eliminated.

CORE OVENS. The Millett Core Oven Company, of Brightwood, Mass., has prepared a very handsome folder dealing with the Millett patent core oven. These ovens are made with swinging quadrants having a door along each radius so that one door closes the oven when the other is swung open. Over 1,500 of these ovens are now in use.

ACID PROOF BRICK. We have received from the New York Brick & Paving Company, of Syracuse, N. Y., a circular describing their acid proof brick for lining sulphite pulp digesters, and for placing around copper vats, acid tanks and the like. These bricks have been in use for such purposes for the past 12 years and samples are furnished those desirous of testing their qualities.

METALS AND ALLOYS.—The Hazard, Coates & Bennett Company, Rochester, N. Y., have issued a folder mentioning their white metals, brass and bronze compositions, babbitt and anti-friction metals. Mention is also made of their red and yellow ingot brass, phosphor bronze, phosphor copper, aluminum bronze and aluminum brass. In addition they supply ingots of any desired composition.

TERABENTINE.—A pamphlet by the Terabentine Company, of Philadelphia, Pa., describes the good qualities of terabentine, which is placed on the market as a substitute for turpentine. It is stated to give entire satisfaction wherever paints and varnishes are made, and will do the same work as turpentine. It has the same flash and fire point as turpentine, and it is safe to use and store. It is free from grease, and dries out completely, but a little more slowly than turpentine.

ALUNDUM.—The Norton Company, of Worcester, Mass., have issued a small pamphlet detailing the merits of the new abrasive "alundum," which is manufactured at the company's electric furnace plant at Niagara Falls. This material is produced in the intense heat of the furnace from bauxite, which is the purest amorphous oxide of aluminum found in nature. Upon cooling, this molten mass solidifies and crystallizes in solid form of alundum of great purity and uniformity throughout.

ENDLESS BELTS.—L. H. Gilmer & Company, 504 Arch street, Philadelphia, Pa., have prepared a very handsome catalogue of their endless belts for power transmission, sand, emery and crocus polishing, and conveying purposes. Soon after these belts were placed on the market the company found that the largest field for them was in the belt polishing line, and they had so many inquiries for belt polishing machinery that they were compelled to take up the question of its supply to their customers. The result is that they can now offer a very large line of polishing and grinding machinery.

LYCOPART. As explained in a circular just received from Smyth, Swoboda & Company, 73 Warren street, New York City, this is offered to the molder in iron, bronze, aluminum, or any other metal, as a satisfactory substitute for lycopodium. As a parting compound to insure the free separation of the pattern from the sand it is claimed to give the most perfect results. It is dusted lightly on the pattern and the mold is made in the usual way. The price is so low that it may be used on all kinds of work, both large and small.

BOLT, NUT AND RIVET MACHINERY.—We have received a large catalogue from the Waterbury Farrel Foundry & Machine Company, of Waterbury, Conn., describing their "cold process" automatic nut, bolt and rivet machinery, and reciprocating screw threaders. Rolling threads upon wire and screw blanks is rapid and economical. In this process the blank is rolled between dies with surfaces grooved to suit the shape of thread. The stock is displaced, but none of it is removed. The threads produced by this method are perfect, and the dies for the work are easily made and very durable. A very wide line of machines for this work is shown in the catalogue.

TOOL STEEL, DRILLS, TAPS, MILLING CUTTERS, etc. A very handsome catalogue has been received from the Baldwin Steel Company, 133 Reade street, New York City, makers of "Hudson" high speed tool steel, twist drills, reamers, taps, milling cutters, etc. Here is illustrated the complete line of high speed tools made by the company. These tools are under expert inspection after every operation and micrometer calipers are used throughout the factory to insure accuracy. Their turret and screw machine tools are stated to be especially advantageous to users of such machines.

POLISHING WHEELS AND SUPPLIES.—A pamphlet just received from the Easton Polishing Supply Company, of Easton, Pa., shows the very wide line of polishing materials and supplies carried by them. They are manufacturers' agents for the highest grade of pure Turkish emery and are in position to quote lowest possible prices on keg or carload lots. Their patented Wray

paper polishing wheels are made in two styles; the straw board wheel is a hard wheel for rough work such as polishing plows, farming tools and all sheet metals. The felt is a soft wheel with slightly yielding surface adapted for finishing work such as grates, mantels, stove trimmings and all flat metal surfaces. These wheels, which are made of paper, are claimed to be most efficient and economical.

MAGNESIUM. A valuable pamphlet prepared by C. W. Leavitt & Company, of 220 Broadway, New York City, considers the many advantages accruing from the use of magnesium for the production of perfect castings. While alloys of magnesium with copper can be used for the refining, it is stated that pure metallic magnesium in the form of sticks, as placed on the market by this company, is the most suitable. The magnesium should constitute about .05 per cent. by weight of the metal melted. It is fastened by copper wire to a small iron rod and then covered with clay with which a little charcoal has been mixed. Just before the pour the magnesium is heated and then plunged into the molten metal, which is thoroughly stirred. The magnesium is melted in a short time, has combined with the fusion and its deoxidizing process has begun. The stirring drives the oxides to the surface, where they are skimmed off before pouring.

CATALOGUE BUREAU

THE METAL INDUSTRY has established a Catalogue Bureau by which it will prepare and do all the work necessary for the making of catalogues, pamphlets, circulars and other printed matter. Estimates will be furnished for writing the description, making engravings, printing, binding, in fact for the entire job from the beginning to the end or any part of it. Let us know your needs and we will tell you just exactly what we can do and what it will cost you. A catalogue should be a trade getter—that is the kind we produce. Write to the CATALOGUE BUREAU of THE METAL INDUSTRY, 61 Beekman street, New York.

OFFICE HEADQUARTERS

When visiting New York, the out-of-town friends of THE METAL INDUSTRY are invited to make our office their headquarters, where a writing desk and telephone service will be at their disposal. Every one interested in the non-ferrous metals and alloys is invited to call.

INFORMATION BUREAU

Subscribers intending to purchase metals, machinery and supplies and desiring the names of the various manufacturers and sellers of these products can obtain the desired information by writing to THE METAL INDUSTRY. Our Information Bureau is for the purpose of answering questions of all kinds. Send for circular.

METAL MARKET REVIEW

METAL MARKET REVIEW.

New York, March 11, 1907.

COPPER.—Standard copper in London rules very strong and has reached further high records, with futures higher than spots and trading continues very heavy. Spot copper opened at £106 17s. 6d. and advanced to £108 15s., the high point for the month, at the close.

The New York market has ruled very strong and at the close of the month we are able to report sales of Lake copper by the leading interest for May and June delivery at 26 cents. These sales have established the other Lake companies on a 26-cent basis. At present writing we have heard of no sales of Electrolytic copper above 25½ cents and this figure could probably be shaded for deliveries running over to May and June. Casting brands hold steady at 24¾ to 25 cents. The exports of copper for the month so far were only 9,072 tons, while the imports were slightly over 10,000 tons, so that we imported about 1,000 tons more than we exported. Estimates of production so far this year do not show any increase, while our consumption is as active as ever, with no signs in sight of any letup, and the market generally appears very strong.

TIN.—The London tin market has been rather quieter. Prices advanced about £2 above the opening figures, but declined later and left prices at the close 5s. lower than on the first of the month.

February was a dull month in the New York market, with consumption estimated at 2,600 tons, while the arrivals were 2,160 tons. The total deliveries so far this year were about 400 tons less than the same period last year. The statistics for the month are uninteresting. The only point worth noting is that the total visible supply at the end of February is 225 tons less than the same month last year, while the price of pig tin is about 6 cents per pound higher. Spot tin to-day, 5-10 ton lots, 41.75 f. o. b. New York, while smaller lots are worth 10 to 15 points higher.

LEAD.—The foreign lead market has held barely steady. Opened at £19 16s. 3d. and closed at £19 10s.

The New York market has held very firm, with a premium of 25 to 30 points over the trust price for all quick delivery lead in this market. The trust continues to bill lead it is now shipping at 6 cents (New York delivery basis), but it has no price on future shipments. The trust in its merciful kindness and wisdom is good enough to allow some consumers to send in their orders (some consumers they will not sell at any price, but that is another story) and the trust will ship the lead when it gets good and ready and the price will be whatever the trust likes to make it. How long consumers of lead are going to stand this kind of treatment is only a matter for the consumers themselves to decide. The remedy is in the hands of the consumers, but so long as they take no action it is presumed they like the treatment. The market for spot lead in New York is very strong at from 6.25 to 6.40; for futures, March-April shipments a shade less. It is to be noted that one or two independent interests are entering the lead fields now and will soon be more or less of a factor in the market.

SPELTER.—The London market has held steady at around £26. This price is so much below our parity that all export business has stopped.

In the home market spelter has ruled very strong. This metal has been in a very strong position for months and at last conditions have forced prices beyond the power of bear operations. The New York market is strong around 7 cents for carload lots, New York delivery. Future shipments can be shaded 10 to 15 points. Small lots from store are worth 7½ cents.

ALUMINUM.—There is no change in the situation. The market is very strong and orders are still behind. Prices range from 48 to 50 cents, according to quality and time of delivery. Ingot and sheet are both sold at a premium above the last list of the aluminum company.

ANTIMONY.—The foreign price of antimony has declined £5 per ton for Halletts and £6 per ton for other brands.

The New York market has ruled fairly steady; persistent efforts during the month to break the market by offering future deliveries at considerable reduction over ruling prices did not have very much effect. The supply of antimony is not over abundant and prices held fairly steady. Cooksons, spot, New York, 25¼ to 25.37½; Halletts, 23.50; other grades, 23.00 to 23.25.

SILVER.—The price of silver in London has advanced about 5/16d. during the month and closed at 32 5/16d. In the New York market prices have followed the advance abroad, closing at 69¼ cents against 68½ cents a month ago.

SHEET METALS.—The price of sheet copper stands at 32 cents base; this last advance was made on February 7. The orders are pressing for all kinds of manufactured copper and the mills continue to run behind on their orders. With Lake copper now on a 26-cent basis we may see a further advance in sheets, etc., before very long.

THE OLD METAL MARKET has ruled very strong, principally through the continued firmness and advance in the copper market. Trading has been fairly active and the general conditions are good. Zinc dross is worth 5.40 to 5.50, New York.

See Advertising Page 23 following for Trade Wants

Metal Prices, March 18, 1907

METALS.	Price per lb.
COPPER, PIG, BAR AND INGOT AND OLD COPPER.	
Duty Free. Manufactured 2½c. per lb.	
Lake, car load lots	26.00
Electrolytic, car load lots	25.50
Casting, car load lots	25.00
TIN—Duty Free.	
Straits of Malacca, car load lots	42.00
LEAD—Duty Pigs, Bars and Old 2⅛c. per lb.; pipe and sheets 2½c. per lb.	
Pig lead, car load lots	6.25
SPELTER—Duty 1½c. per lb.	
Western, car load lots	7.20
ALUMINUM—Duty Crude, 8c. per lb. Plates, sheets, bars and rods 13c. per lb.	
Small lots .....Nominal	50.00
100 lb. lots..... "	40.00
Ton lots ..... "	40.00
ANTIMONY—Duty ¾c. per lb.	
Cooksons, cask lots	25.25
Hallets, cask lots	23.35
Other, cask lots	23.00
NICKEL—Duty 6c. per lb.	
Shot, Plaquettes, Ingots, Blocks, according to quantity	.50 to .60
MANGANESE—Duty 20%	.75
MAGNESIUM—Duty Free	$1.50 to $1.60
BISMUTH—Duty Free	1.50 to 1.55
CADMIUM—Duty Free	1.55 to 1.60
	Price per oz.
GOLD—Duty Free	$20.67
SILVER—Duty Free	67¾
PLATINUM—Duty Free	38.00
QUICKSILVER—Duty 7c. per lb. Price per flask	42.00

OLD METALS.	Price per lb.	
Heavy Cut Copper	22.00	22.50
Copper Wire	21.50	22.00
Light Copper	20.00	20.50
Heavy Mach. Comp	19.50	20.00
Heavy Brass	15.00	15.50
Light Brass	12.25	12.75
No. 1 Yellow Brass Turnings	14.00	15.00
No. 1 Comp. Turnings	16.00	17.00
Heavy Lead	5.50	6.00
Zinc Scrap	5.00	5.00
Scrap Aluminum, sheet, pure	30.00	32.00
Scrap Aluminum, cast, alloyed	25.00	27.00
Scrap Aluminum, turnings	10.00	13.00
Old Nickel, solid	18.00	25.00
No. 1 Pewter	31.00	32.00

	Price per lb.
SILICON COPPER, according to quantity	.37 to .39
PHOSPHOR COPPER, 5%	.26 to .28
Phosphor Tin	.47 to .48
Brass Ingot, Yellow	.16 to .18
Brass Ingot, Red	.19 to .23
Bronze Ingot	.17 to .21
Manganese Bronze	.20 to .22
Phosphor Bronze	.22 to .26

ZINC—Duty, sheet, 2c. per lb.	Price per lb.
600 lb. casks	8.90
Open casks	9.40

PHOSPHORUS—Duty 18c. per lb.	
According to quantity	.37 to .50

PRICES OF SHEET COPPER.

SIZES OF SHEETS.		96oz. & over 75 lb. sheet 30x60 and heavier	64oz. to 96oz. 50 to 75 lb. sheet 30x60	32oz. to 64oz. 25 to 50 lb. sheet 30x60	24oz. to 32oz. 18¾ to 25 lb. sheet 30x60	16oz. to 24oz. 12½ to 18¾ lb. sheet 30x60	14oz. and 16oz. 11 to 12½ lb. sheet 30x60
		CENTS PER POUND.					
Not wider than 30 ins.	Not longer than 72 ins.	32	32	32	32	32	33
	Longer than 72 ins. Not longer than 96 ins.	32	32	32	32	32	33
	Longer than 96 ins.	32	32	32	32	32	34
Wider than 30 ins. but not wider than 36 ins.	Not longer than 72 ins.	32	32	32	32	32	34
	Longer than 72 ins. Not longer than 96 ins.	32	32	32	32	32	34
	Longer than 96 ins. Not longer than 120 ins.	32	32	32	32	33	35
	Longer than 120 ins.	32	32	32	33	34	
Wider than 36 ins. but not wider than 48 ins.	Not longer than 72 ins.	32	32	32	33	34	36
	Longer than 72 ins. Not longer than 96 ins.	32	32	32	33	35	37
	Longer than 96 ins. Not longer than 120 ins.	32	32	32	34	36	40
	Longer than 120 ins.	32	32	33	35	38	
Wider than 48 ins. but not wider than 60 ins.	Not longer than 72 ins.	32	32	32	33	35	38
	Longer than 72 ins. Not longer than 96 ins.	32	32	32	34	36	41
	Longer than 96 ins. Not longer than 120 ins.	32	32	33	35	38	
	Longer than 120 ins.	33	33	34	36	40	
Wider than 60 ins. but not wider than 72 ins.	Not longer than 96 ins.	32	32	33	35	40	
	Longer than 96 ins. Not longer than 120 ins.	32	32	34	37	42	
	Longer than 120 ins.	33	33	35	40		
Wider than 72 ins. but not wider than 108 ins.	Not longer than 96 ins.	33	33	35	38		
	Longer than 96 ins. Not longer than 120 ins.	34	34	36	39		
	Longer than 120 ins.	35	35	37	41		
Wider than 108 ins.	Not longer than 132 ins.	36	36	38			
	Longer than 132 ins.	37	37	40			

Rolled Round Copper, ⅝ inch diameter or over, 32 cents per pound. (Cold Drawn, Square and Special Shapes, extra.)

Circles, Segments and Pattern Sheets three (3) cents per pound advance over prices of Sheet Copper required to cut them from.

All Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, one (1) cent per pound over the foregoing prices.

All Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, two (2) cents per pound over the foregoing prices.

Cold Rolled and Annealed Copper, Sheets and Circles, take the same price as Cold or Hard Rolled Copper of corresponding dimensions and thickness.

All Polished Copper, 20 inches wide and under, one (1) cent per pound advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 inches wide, two (2) cents per pound advance over the price for Cold Rolled Copper.

Planished Copper, one (1) cent per pound more than Polished Copper.

Cold Rolled Copper prepared suitable for polishing, same prices and extras as Polished Copper.

Tinning Sheets, on one side, 3½c. per square foot.

For tinning both sides, double the above price.

For tinning the edge of sheets, one or both sides, price shall be the same as for tinning all of one side of the specified sheet.

Metal Prices, March 18, 1907

Net Cash Prices.

COPPER BOTTOMS, PITS AND FLATS.

14 oz. to square foot, and heavier, per lb.	36c.
12 oz. and up to 14 oz. to square foot, per lb.	37c.
10 oz. and up to 12 oz.	39c.
Lighter than 10 oz.	42c.

Circles less than 8 in. dia., 2c. per lb. additional.
Circles over 13 in. dia. are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1c. per lb. extra.

PRICES ON BRASS MATERIAL.

In Effect January 21, 1907.

To customers who purchase less than 5,000 pounds per month and over 5,000 pounds per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.22¾	$0.26	$0.28¼
Wire ¼" and larger	.23	.26¼	.28½
Wire smaller than ¼" to No. 8, inclusive	.23¾	.27	.29¼
Wire smaller than No. 8 to No. 10, inclusive	.24¼	.27½	.29¾
Rods smaller than ½" diameter	.23¼	.26½	.29¾
Rods ½" to 1" diameter, inclusive	.23	.26¼	.29½
Brazed brass tubing	.29½	—	—
Brazed Bronze and Copper Tubing	—	—	.33¼
Open Seam Brass Tubing	.27½	—	—
Open Seam Bronze Tubing	—	—	.31¼
Brass Moulding	.29½	—	—
Bronze Moulding	—	—	.33¾

15% discount from all extras.

To customers who purchase less than 5,000 pounds per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.23¾	$0.27	$0.29½
Wire ¼" and larger	.24	.27¼	.29½
Wire smaller than ¼" to No. 8, inclusive	.24¾	.28	.30¼
Wire smaller than No. 8 to No. 10, inclusive	.25¼	.28½	.30¾
Rods smaller than ½" diameter	.24¼	.27½	.30¾
Rods ½" to 1" diameter, inclusive	.24	.27¼	.30½
Brazed brass tubing	.30⅞	—	—
Brazed bronze and copper tubing	—	—	.34¼
Open seam brass tubing	.28⅞	—	—
Open seam bronze tubing	—	—	.32¼
Brass moulding	.30⅞	—	—
Bronze moulding	—	—	.34¾

5% discount from all extras.

PRICES FOR SEAMLESS BRASS TUBING.

From 1¼ to 3½ in. O. D. Nos. 4 to 13 Stubs Gauge, 27c. per lb.
Seamless Copper Tubing, 32c. per. lb.

For other sizes see Manufacturers' List.

PRICES FOR SEAMLESS BRASS TUBING Iron Pipe Sizes.

Iron Pipe Size.	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price per lb.	35	34	29	28	27	27	27	27	27	27	27	28	29	31	33	34

PRICE LIST OF IRON LINED TUBING—NOT POLISHED.

	Per 100 Feet. Brass.	Bronze.
⅜ inch	$8.00	$9.00
½ inch	8.00	9.00
⅝ inch	10.00	11.00
¾ inch	12.00	13.00
⅞ inch	14.00	15.00
1 inch	18.00	20.00
1¼ inch	22.00	24.00
1¼ inch	25.00	27.00
1½ inch	32.00	35.00
1¾ inch	45.00	48.00
2 inch	56.00	60.00

Discount 30 per cent.

GERMAN SILVER TUBING.

4 per cent. to No. 19, B. & S. Gauge, inclusive	$0.60
6 " " 19, " " "	.70
9 " " 19, " " "	.85
12 " " 19, " " "	1.00
15 " " 19, " " "	1.15
16 " " 19, " " "	1.20
18 " " 19, " " "	1.30

German Silver Tubing thinner than No. 19 B. & S. Gauge add same advances as for Brazed Brass Tube.
For cutting to special lengths add same advances as for Brazed Brass Tube. Discount 10 per cent.

Prices on Sheet Block Tin and Britannia Metal.

Not over 18 in. in width, not thinner than 23 B. S. Gauge, 4c. above price of pig tin in same quantity.

Not over 35 in. in width, not thinner than 22 B. S. Gauge, 5c. above price of pig tin.

PRICE LIST FOR SHEET ALUMINUM—B. & S. Gauge.

Wider than and including	*3in. 12in. in coils.	6in. 14in.	14in. 16in.	16in. 18in.	18in. 20in.	20in. 24in.	24in. 30in.	30in. 36in.	36in. 40in.	Cutting to Length.	Polishing or Satin Finishing one Side.
No. 13 and heavier	47	47	49	49	49	49	52	52	52	1	2
" 14	47	47	49	49	49	49	52	52	52	1	2
" 15	47	47	49	49	49	49	52	52	52	1	2
" 16	47	47	49	49	49	49	52	52	52	1	2
" 17	47	47	49	49	49	49	52	52	52	1	3
" 18	47	47	49	49	49	49	52	52	55	1	3
" 19	47	47	49	49	49	49	52	53	56	1	4
" 20	47	49	49	49	49	51	54	55	57	1	4
" 21	47	51	51	51	51	53	56	57	63	2	5
" 22	47	51	51	51	53	53	56	60	64	2	5
" 23	47	51	51	51	53	53	56	62	65	2	6
" 24	47	51	53	55	55	55	58	64	67	2	6
" 25	49	52	54	56	56	56	59	66	70	2	7
" 26	49	52	55	59	59	59	64	68	74	2	8
" 27	49	53	57	61	61	62	67	71	77	2	10
" 28	49	53	59	61	62	62	69	75	80	2	11
" 29	51	54	61	63	65	65	74	80	85	2	13
" 30	51	55	63	65	69	75	82	85	90	2	15
" 31	56	60	68	71	76	84	87	90	96	3	17
" 32	58	62	70	74	82	90	97	103	108	3	19
" 33	60	64	73	78	86	97	104	113	123	3	21
" 34	63	68	75	83	91	104	116	123	133	3	25
" 35	..	78	83	93	103	113	128	138	..	..	..
" 36	..	93	103	113	128	133	148	..	..	..	..
" 37	..	117	121	142	157	172	187	..	..	..	..
" 38	..	137	152	167	182	197	217	..	..	..	..
" 39	..	157	177	197	217	237	..	..	..	..	..
" 40	..	187	217	237	257	..	..	..	..	..	..

*Polished or scratch brushed 2 sides, double above prices.

In flat rolled sheets the above prices refer to lengths between 2 and 8 feet. Prices furnished by the manufacturers for wider and narrower sheet. All columns except the first refer to flat rolled sheet. Prices are for 50 lbs. or more at one time. Less quantities 5c. lb. extra. Charges made for boxing.

PRICES LIST OF SEAMLESS ALUMINUM TUBING—STUBS' GAUGE.

Stubs' G.	¼"	⅜"	½"	⅝"	¾"	1"	1½"	2"	2½"	2¾"
4 to 11	..	..	96	86	83	77	67	61	61	61
12	..	1.08	96	86	85	77	67	61	61	61
13	..	1.08	96	86	83	77	67	64	64	64
14	..	1.08	96	86	85	77	67	64	64	64
15	..	1.12	96	89	86	80	70	67	67	67
16	..	1.15	99	93	89	83	70	70	70	70
17	..	1.18	1.02	96	93	86	73	73	73	73
18	1.85	1.24	1.05	99	93	86	77	77	77	80
19	1.88	1.28	1.08	1.02	99	93	83	80	80	83
20	1.95	1.31	1.15	1.08	1.05	99	89	86	86	89
21	2.01	1.37	1.21	1.15	1.12	1.05	99	93	93	96
22	2.17	1.44	1.24	1.18	1.15	1.08	1.05	99	1.05	1.05
23	2.33	1.50	1.31	1.24	1.21	1.15	1.15	1.08	1.15	1.15
24	2.48	1.60	1.37	1.31	1.28	1.18	1.21	1.21	1.24	..
25	2.65	1.69	1.47	1.37	1.34	1.28	1.34	..	..	..

Prices are for lots of 50 lbs. Boxing extra. Smaller, larger and intermediate sizes furnished by manufacturers.

PRICE LIST FOR ALUMINUM ROD AND WIRE—B. & S. GAUGE.

Diameter B. & S. G'ge	000 to No. 10.	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.	No. 16.	No. 17.	No. 18.	No. 19.	No. 20.	No. 21.	No. 22.
Price, per lb.	43	43½	43½	44	44½	45	45½	46	47	48	49	52	57

200 lbs. to 30,000 lbs., 3 cents off list; 30,000 lbs. and over, 4 cents off list.

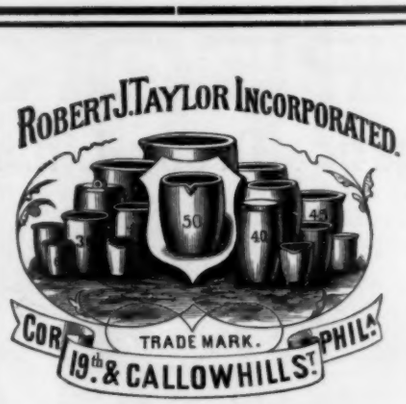
PRICE LIST FOR GERMAN SILVER IN SHEETS AND ROLLS.

Per cent.	Price per lb.	Per cent.	Price per lb.
12	$0.52	16	$0.58
13	.53	17	.59
14	.54	18	.60
15	.55		

These prices are for sheets and rolls over 2 inches in width, to and including 8 inches in width and to No. 20, inclusive, American or Brown & Sharpe's Gauge. Prices are for 100 lbs. or more of one size and gauge in one order. Discount 30 per cent.

Munts or Yellow Metal Sheathing (14" x 48")	22c. lb. net base.
" " " Rectangular Sheets other than Sheathing	24c. " " "
" " " Rod	23c. " " "
Tobin Bronze Rod	25c. " " "

Above are for 100 lbs. or more in one order.



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For Years the Recognized Standard for Uniform Service

IF INTERESTED WRITE US

ROBERT J. TAYLOR, INCORPORATED

1900 to 1916 Callowhill Street *PHILADELPHIA, PA.*

CRUCIBLES

¶ All kinds, and for all purposes. We make but one quality, "The Best." If you are using an Oil Furnace, it will be dollars in your pocket to give our Special Oil Pot a trial. They have a good reputation.

R. B. SEIDEL, Inc.

Philadelphia Black Lead Crucible Works,

1322-34 Callowhill Street, PHILADELPHIA

Annealing Without Oxidation by Automatic Machines

BATES & PEARD ANNEALING FURNACE CO

C. M. DALLY, Agent, 29 Broadway, N. Y.

NO PICKLING **Large Saving in Labor and Fuel**

NO SCALE Illustrated Catalogue Sent on Application

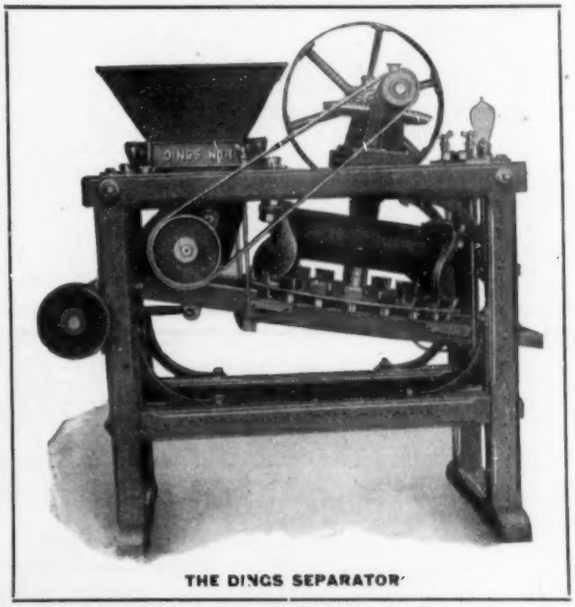
Magnetic Separators

for removing Iron from Brass, Bronze, Babbit metal chips, Emery dust, etc. A postal will bring reduced price-list. Sold by J. W. Paxson Co., Philadelphia, Pa.

CHAS. T. BURLIN

Whitinsville, Mass.

MAGNETIC SEPARATORS



THE DINGS SEPARATOR

DIFFERENT KINDS AND SIZES MADE TO SUIT ANY REQUIREMENTS

DINGS ELECTRO-MAGNETIC SEPARATOR CO. MILWAUKEE, WIS.

MACKELLAR'S PREPARED CHARCOAL

FOR BRASS FOUNDERS

Has a wide reputation for superiority. Write for samples, prices and full information.

THE PEEKSKILL FACING MILLS Address **R. MacKELLAR'S SONS CO.**

Established 1844. Incorporated 1902. **Peekskill, N. Y.**

Registered Trade Mark.

WAX WIRE

of the **LION BRAND** supplied by us is superior to all others, and invaluable for delicate and intricate core work. It leaves the vent hole free and unobstructed. Sizes from 1 m.m. to 12 m.m. The former costs about 5c. for 100 lineal feet. The larger sizes proportionately inexpensive. Perfectly flexible under all temperatures. In coils of one pound each continuous lengths.

Samples sufficient for practical test, free of charge on application

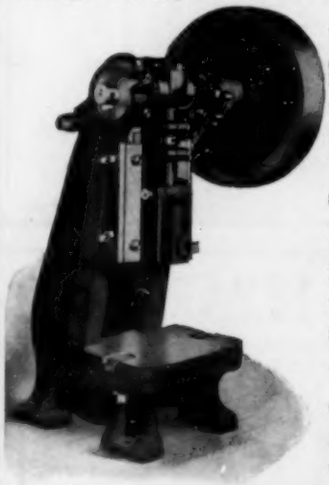
ALFRED FIELD & CO., 93 CHAMBERS STREET NEW YORK CITY

For Index to Advertisements See Page 32.

"BLISS"

BABY BENCH POWER PRESS

This press is of entirely new design and is particularly adapted for light work to take the place of foot presses. It is used in the manufacture of burners, light jewelry work, etc., for small hole punching, blanking and forming.



DIMENSIONS

Weight, to set on bench	lbs.	250
Opening in bed, dia.	ins.	3
Dist. back from center of slide	ins.	3
Width of opening in back	ins.	4
Width between gibs,	ins.	3¼
Dist. bed to slide, stroke down, adj. up	ins.	5
Standard stroke of slide	in.	1
Maximum stroke of slide	ins.	2
Adjustment of slide,	in.	1
Dia. and face of wheel	ins.	13 x 2¼
Weight of balance wheel	lbs.	50
Speed of wheel per minute	revs.	150 to 200
Area top of bolster plate, F. & B. x R. & L.	ins.	6 x 9
Thickness of bolster plate	in.	¾
Height to center of shaft	ins.	20½
Floor space over all, F. & B. x R. & L.	ins.	16 x 16

IN STOCK FOR IMMEDIATE DELIVERY

"Presses for Every Purpose."

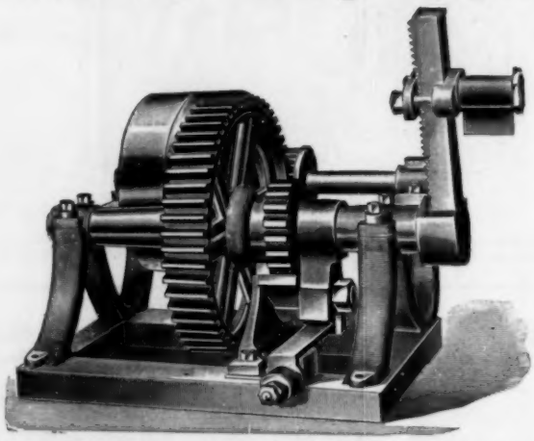
E. W. BLISS CO.

23 ADAMS STREET, BROOKLYN, N. Y., U. S. A.

European Office—Clichy pres Paris, France. Agents for Chicago and vicinity—Stiles-Morse Co., 65 W. Washington Street, Chicago, Ill.

The PECK

Automatic Drop Lifter



Can be readily applied to any drop, and while it increases your output, decreases your pay roll.

We manufacture DROP PRESSES for all purposes and are Specialists in that line.

THE PECK DROP PRESS WORKS

MINER & PECK MFG. CO., Proprietors

425 Chapel St. NEW HAVEN, CONN.

The TORRINGTON MANUFACTURING CO.

TORRINGTON, CONN.

Finishing Machinery for Brass and Copper Mills to Order

Acid Cleaning, Steam and Sawdust Drying-out Machines.

Power Presses, Single and Double Action Cam or Crank.

Flattening, Straightening and Overhauling Machinery.

Multiple Plunger, Cut and Carry Presses.

Slitters, Scrap Cutters and Coilers, in a variety of Styles and Sizes.

Channel Iron Mill Trucks to suit any Requirements.

Metal Saws and Power Shears.

Drawbenches.

SPECIAL MACHINERY AND TOOLS OF ANY DESCRIPTION

ROLLS

FOR

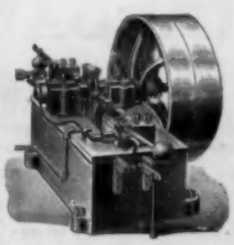
Steel, Iron, Brass, Copper and Rubber Works

PHILADELPHIA ROLL & MACHINE COMPANY

23d Street and Washington Avenue, Philadelphia, Pa.

New England Representatives:
HARRINGTON, ROBINSON & CO.
272 Franklin Street
Boston, Mass.

Cable Address:
"PHILROLLCO., PHILADELPHIA"
Long Distance and Local Phone
LOCUST 825



METAL INDUSTRIES

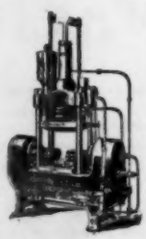
Have always been of special interest to us. We have followed this line closely and have a large number of special tools adapted for metal workers' use.

Hydraulic presses of all descriptions, punches, benders and all types of hydraulic tools.

Write us, fully stating your requirements.

WATSON STILLMAN CO., Main Office, 26 Cortlandt St., N. Y. City

BRANCH OFFICE, 453 THE ROOKERY, CHICAGO, ILL.



For Index of Advertisements See Pages 32-33

The GLOBE TUMBLER

admits of a perfect adjustment in the degree of action on the barrel's contents—this is regulated by the hand-wheel at the side. Sheet-metal stampings and small castings are operated upon without injury. The tumbling parts can be seen, samples removed and replaced, while the machine is running. The barrel can be dumped into a small receptacle in one operation; the old kind involves two—scattering the tumbled parts over the floor, and picking them up. It occupies small floor-space—which is money these days. You can sweep around it easily, for it's a one-legged machine. New booklet for the asking.

THE GLOBE MACHINE AND STAMPING CO.
976 Hamilton Avenue, Cleveland, O.

English Agents
J. W. JACKMAN & CO., Caxton House, Westminster, London

Endless Polishing Belts, Polishing Machinery and Supplies

¶ There are two features of our new catalog — ENDLESS BELTS and BELT POLISHING MACHINES. The latter includes 20 or more Belt Sanding and Polishing Machines. Write for a copy at once.

L. H. GILMER & CO.
PHILADELPHIA

Dumping Position.

Operation of BAIRD TILTING TUMBLERS is VISIBLE, not BLIND

Two size machines, No. 1 and No. 2, will take Barrels of all kinds up to 36 in. diameter.

New Catalogue "C" tells all.

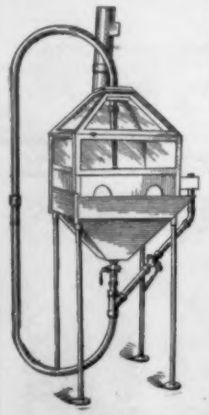
THE BAIRD MACHINE CO., Oakville, Conn., U. S. A.

BAIRD TUMBLERS

are quick and easy to operate, built STRONG to withstand rough usage and will run in either position shown in cuts or at any intermediate elevation.

WRITE NOW

Elevated Position.



SIPPEL PATENT SAND BLAST

PATENTED SEPT. 16, 1902.

For cleanliness, perfect work and rapidity of action it is without an equal. A trial will cost nothing.

References from leading Jewelers and Brass Finishers will be furnished upon request.

Correspondence solicited, and all information cheerfully furnished. For full particulars and price address

THEO. A. SIPPEL
Patentee and Sole Manufacturer
205 McWhorter Street, Newark, N. J.

LEIMAN'S NEW SAND BLAST

PATENTED.

SIMPLE, EFFECTIVE, ECONOMICAL.

NEW FEATURES—Let us tell you about them.

RESULTS—Let us show you samples of work done.

IMPROVED HIGH PRESSURE BLOWER

NOISELESS INEXPENSIVE.

Delivers Greater Volume at Higher Pressure Than Any Other Made.

PATENTED.

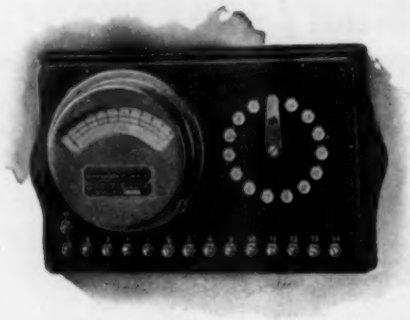
LEIMAN BROS.
Jewelers', Silversmiths' and Metal Workers' Machinery, Tools and WORK BENCHES
139-141-143 Centre St., NEW YORK, N. Y.
66-68-70 Bonykamper Ave., NEWARK, N. J.

IMPORTED STONE WARE

Superior to anything domestic. For metal and chemical plants. Absolute proof of this statement. Largest stock in America of any importing house.

FREDERICK BERTUCH & CO., Temple Court Building, NEW YORK

WESTON ELECTROLYTIC VOLTMETER



The accompanying cut illustrates a new model Weston Voltmeter expressly designed to meet the requirements of Electroplaters, Electrotypers and others engaged in the art of Electrometallurgy. It is accurate and thoroughly reliable. It is built in a thoroughly substantial manner; the workmanship is high grade. It is provided with a 15 point switch so that the difference of potential can be determined at any one of 15 tanks or all of them successively.

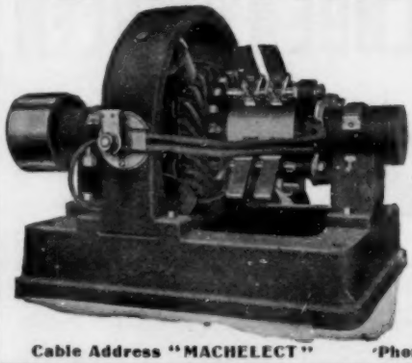
It is Low Priced and Good

Special Bulletin describing the instrument and giving prices can be obtained upon application.

Weston Electrical Instrument Co.

Waverly Park, NEWARK, N. J., U. S. A.

DYNAMOS



For Electro-Plating, Galvanizing and all other low voltage work.

50-8000 Amperes, 3-30 Volts.

Shunt, compound and separately excited.

Catalog on request

CHAS. J. BOGUE ELECTRIC CO

213 Centre Street NEW YORK CITY

Cable Address "MACHELECT" Phone, 2111 Spring

Combination Noiseless Polishing, Buffing, Drilling, Grinding, Sawing, Turning, and Lapping

Variable Speed Electric Lathe Motors

1907 MODEL **No Oiling or Lubricating Necessary**

For Metal Workers, Platers, Jewelers, Silversmiths, Opticians, Laboratories and for all trades and purposes.

Combination of Seven Lathes in one at price of one. A simple, clean, convenient and entire workshop in itself.

Absolutely guaranteed for one year after shipment. Dust-proof, Air and Water Tight. Can be attached and detached in one minute to any ordinary electric light socket.

Are always ready for immediate use, no further adjustment being required.

Made from **1-8 H. P.** to **3 H. P.**

Our Motors will run for months with no attention to the bearings or brushes and run cool under all conditions of load.

81 Nassau Street **THE W. GREEN ELECTRIC COMPANY** *New York, U.S.A.*

Mfrs. of Electric Lathe Motors, Plating Dynamos and Plating Dynamotors

Particulars and Prices on Application. We Solicit a Visit to Our Factory and Salesrooms.

OTTO ENGINES

THE NEW YEAR

OTTO OTTO

May be made more prosperous by installing the right kind of a power plant. "Otto" Engines are at once dependable and economical. Our thirty years of experience insures it; our reputation as high grade Manufacturers guarantees it, and the testimony of fifteen thousand satisfied users proves it. Engines and Gas Producers are our only product, and our entire stock of energy and gray matter is expended in making them good.

OTTO GAS ENGINE WORKS, Phila, Pa.

STANDARD OF THE WORLD

EMIL SCHNEIDER

298 to 306 South St., NEWARK, N. J.

Smelter and Refiner of

Gold, Silver and Copper

and Manufacturer of

Soldering Fluxes

Will pay very highest prices for materials containing above 2 per cent. copper. Upon receipt of 2 oz. samples we will submit best prices on any of the following named materials: Grindings, Polishings, Buffs, Tailings, Sweepings, Skimmings and Washing Mud.

SYRACUSE SMELTING WORKS

36th St. and 10th Ave., New York City

WE PURCHASE

SKIMMINGS, ASHES, GRINDINGS, BUFFINGS, FILINGS, RESIDUES, DROSSES, Etc.

WE SELL

ALL CLASSES OF NEW AND OLD METALS

SOLE SELLING AGENTS

Montreal Copper Co. (LTD.)

INGOT COPPER, INGOT BRASS, PHOSPHOR TIN

Canadian Works, Montreal

Our New Patent Revolving Plating Apparatus for Automatic Plating in Nickel, Copper, Zinc, Brass or Bronze Solutions

Apparatus Ready to Receive or Discharge Work.

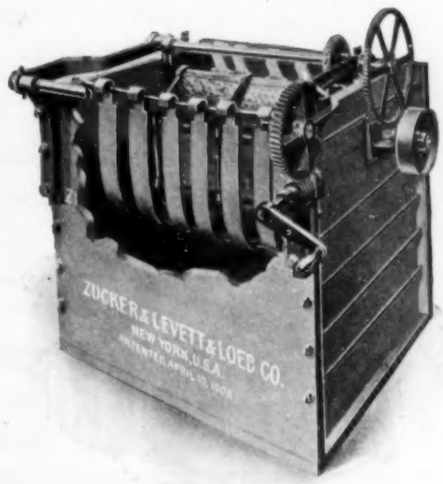
This apparatus consists of a wooden tank 32 x 32 x 36 with a revolving wooden hexagonal cylinder.

The rotation of the cylinder polishes the work and it comes out bright and does not require buffing. A feature of the apparatus is the crank and gear by which the cylinder is readily raised and lowered in the solution.

The apparatus is sold with or without solution or anodes, Solution required, 120 gallons.

We manufacture curved anodes with cast hook to insure good working. 12 are used in each tank.

For further particulars and net prices apply to



Apparatus in Working Position.

Zucker & Levett & Loeb Company

Sole Manufacturers **New York, U. S. A.**

SOMETHING NEW FOR THE BUFFING, POLISHING AND GRINDING ROOM

Patent Separator

V. & L. Patent Separator, Hood and Metal Saving Device

HUNDREDS OF THEM IN USE WHY NOT BE UP-TO-DATE?

This Separator is constructed to separate the line and dust from the air. Also can be placed next to the fan and collects material in bottom.

VENDERBUSH & LOOMAN

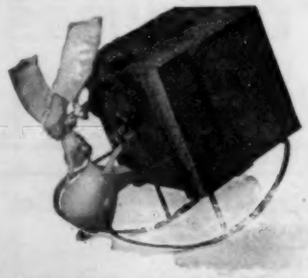
177 LARNED ST., WEST, DETROIT, MICH., U.S.A.

Patent Hood and Metal Saving Device

Save Money

The hood and metal saving device for polishing or grinding wheels can be attached easily to machine and saves from 5 to 20 lbs. of metal per day.

PLATERS! METAL WORKERS!



¶ Invest $5 in this Inclinator and save Hundreds of Dollars in Acid Spills. Put on or taken off in a jiffy.

One Does for All Your Carboys **Sent on Approval**

CARBOY INCLINATOR CO.

1733 Flora Street, PHILADELPHIA, PA.

"CRISTOLINE"

Applied to any bright metal surface will prevent Tarnish and Corrosion.

Use on Engines, Machinery, Guns, Tools, or Plated Ware, or Goods for Exhibition.

Successfully used on Automobiles, Bicycles or Carriages, both on the metal or varnished parts.

Invisible, waterproof, easily applied.

Dealers, or large sample by mail for 30 cents.

CHAS. A. G. WINTHER

170 Summer Street **BOSTON, MASS.**

The "Nikolas" Lacquers

Are the only ones that have always been of a good uniform quality. We SAVE you trade, worry and money

G. J. NIKOLAS & CO.

400 W. Van Buren St., Chicago, Ill. **New York Office, 85 Centre St.**

DEPOTS Hardware Agency Co. Boston, Mass. J. D. French Co. San Francisco, Cal. J. O. Wilson & Co. London, Eng.

LACQUER

is made by us for every branch of The Metal Industries.

Dipping Lacquers, *that dip.* for oxidized Copper, brass work.

Fine brush Lacquers, *that brush and brush well.* for Chandeliers and Brass Beds, with the body, color, luster and brushing quality which pleases those who from experience with good lacquers are able to judge the best when they find it.

M. L. Barrett & Co.,

MANUFACTURERS—IMPORTERS

219 LAKE ST. CHICAGO

CLEANS and POLISHES

All Silverware, Brass, Copper, Gold, Nickel, Zinc, Tin and Enamelware, Glassware, Gas Fixtures, Marblework, Floors, Woodwork, Tile, Onyx, Wall Decorations, etc. :: Non-inflamable

OWEN C. HASSLER CO. 565 W. Fullerton Avenue CHICAGO, ILL.

ARE YOU PROGRESSIVE?

Or are you still using

A HANDFUL OF PIG'S HAIR TIED TO A STICK

to apply your Paint, Japan, Enamel, Lacquer, Bronze, Etc., to your work?

THE OTHER FELLOW

uses our SPRAYERS or AIR BRUSHES, and does better work in half the time. Other trades have progressed, why stick to the brush of the stone age? BETTER WORK AT LESS COST, IF YOU DO IT OUR WAY.

EUREKA PNEUMATIC SPRAY CO.

92 LAFAYETTE STREET, NEW YORK

AMES SWORD COMPANY

CHICOPEE, MASS.

Manufacturers of

ENDLESS SEWED POLISHING BELTS

Correspondence Solicited *Discounts Quoted*

When Through Experimenting Use

NEW ERA LACQUERS

NEW ERA LUSTRE CO.

LACQUER MAKERS

NEW HAVEN : : : CONN.

Write us for prices of

Polishers and Platers Supplies

HARDWARE AGENCY COMPANY

224 Franklin Street, Boston, Mass.

Easton Polishing Supply Co.

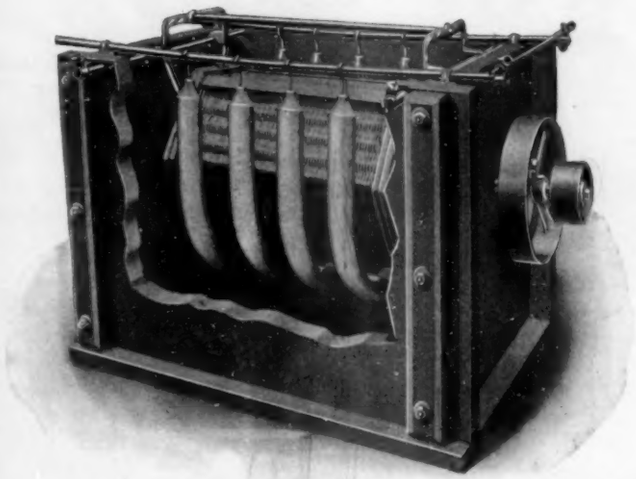
EASTON, PA.

Manufacturers

TURKISH EMERY	POLISHING WHEELS
EMERY CAKE	PRINTERS INK BUFFS
EMERY PASTE	CANVAS WHEELS

Secure our prices before ordering

Mechanical Electro-Plating Apparatus



PATENTED JUNE 22, 1897, FEBRUARY 24, 1903, OCTOBER 11, 1904. OTHER PATENTS PENDING.

The most efficient plating apparatus in the market. Over 400 in use by the trade.

We will furnish sample lots of work without charge.

This apparatus is a proved money saver where small work is to be plated. Can be used in Nickel, Copper, Brass, Zinc and Silver Solutions.

No Stringing. No Wire Used.
No Metal Plating Trays or Baskets.
No Unstringing. No Loss of Metal.
Capacity: 50 lbs. to 500 lbs., according to size.
Basket can be removed at will—without interfering with drive. In larger sizes basket is raised and lowered automatically.
Useful for plating.
Bolts, Nuts, Rivets, Screws, Buckles, Ferrules, Typewriter and Sewing Machine Parts, Lamp Fixtures, Saddlery and Trunk Hardware, Carriage Trimmings, Screw Tops, Shells, Stove Fittings, Locks, Keys and small work.

Write for Catalogue and Prices.

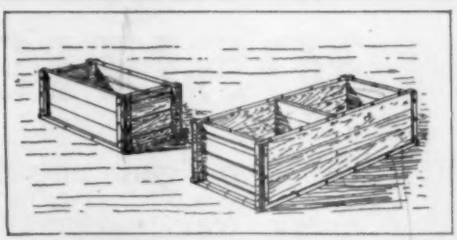
THE HANSON & VAN WINKLE COMPANY

Manufacturers of Dynamos from 50 to 5,000 Ampere Capacity, and all Supplies for Electro-deposition

MAIN OFFICE AND FACTORY
219-221 Market St., Newark, N. J., U. S. A.

BRANCHES
30-32 South Canal St., Chicago, Ill., U. S. A.

TANKS



Electro-Plating Tanks

A SPECIALTY

Write for Prices

THE A. T. STEARNS LUMBER CO., Neponset, Boston, Mass.

E. REED BURNS

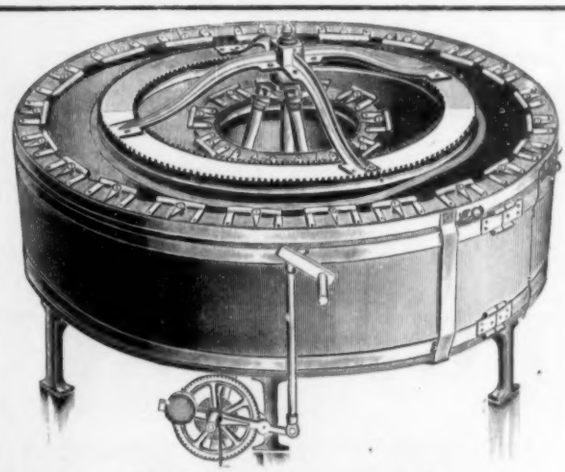
MANUFACTURER OF

Brass and Nickel Platers' Supplies

40 and 42 WITHERS STREET
BROOKLYN, N. Y.

WRITE FOR PRICES

WESTERN AGENCY 20 No. Desplaines Street, CHICAGO



CIRCULAR FRAME PLATING TANK.

Cut Down Your Plating Costs

BY USING OUR

MECHANICAL ELECTRO-PLATING TANKS.

Produce better work at lower cost than any other method.
No spoiled work.
Can be used with any kind of plating solution.

INVESTIGATE.

Tanks have been in use ten years.

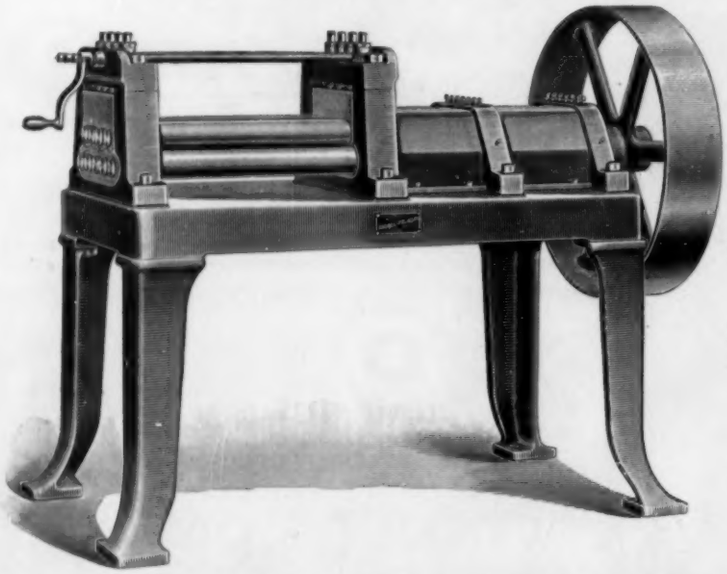
Write for catalog, prices and particulars.

See January issue THE METAL INDUSTRY for full description. Furnished in either Round or Rectangular style.

SCHREIBER & CONCHAR MFG. CO.,
DUBUQUE, IOWA.

WE HAVE IN STOCK ONE 9-ROLL STRAIGHTENER

FOR IMMEDIATE DISPOSAL



(WITH SPINDLE DRIVE)

This machine will straighten very thin brass or copper.

It has crucible steel rolls and steel pinions, and adjustment is provided for raising and lowering top rolls separately and also for keeping ends of rolls parallel. Diameter of rolls, 2⅝ inches; face of rolls, 30 inches; diameter of neck of rolls, 2 inches; floor to nip of rolls, 35 inches; diameter and face of driving pulley, 30 x 5½ inches; speed of pulley, 90 revolutions per minute; surface speed of rolls, 61.85 feet per minute. Floor space, 72 x 34 inches. Weight, 2,500 pounds.

If interested, write us promptly and we will be pleased to give any further information that may be required.

THE WATERBURY FARREL FOUNDRY & MACHINE CO.

WATERBURY, CONN., U. S. A.

TRIPOLI COMPOSITION

The best, because the most effective. No "gumming up" of wheels, quick cutting and satisfactory in every way.

POWDERED CHARCOAL

for Brass Founders, ground from solid wood and bolted through silk mesh—absolutely pure.

I manufacture Polishers' and Platers' Compositions and Foundry Facings. Would You know more? Write me a letter or send for catalogue.

FREDERIC B. STEVENS

Corner Larned and Third Streets, - - - DETROIT, MICH.